MARCH 7, 2016

TIME

No traffic.
No accidents.
No deaths.

All you have to do is **give up your right to drive.**

By Matt Vella

Ingenuity keeps her city's power on and conquers his fear of the dark.

Everyone wants the lights to stay on during a storm. A city official needs to keep an entire city safe and happy. A 5-year-old needs his nightlight to keep the monsters away. For them and millions of other people, Siemens Digital Grid technology manages and reroutes power. Ingenuity helps keep the power on, no matter what nature is doing.

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TIME
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Cover Story

The Driverless Carriage

The human automobile driver is about to be put out to pasture. TIME explores what the digital future means for America's love affair with the open road

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We're simply not very good at it

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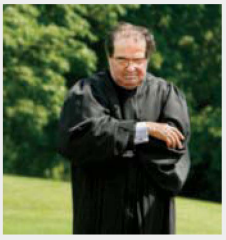

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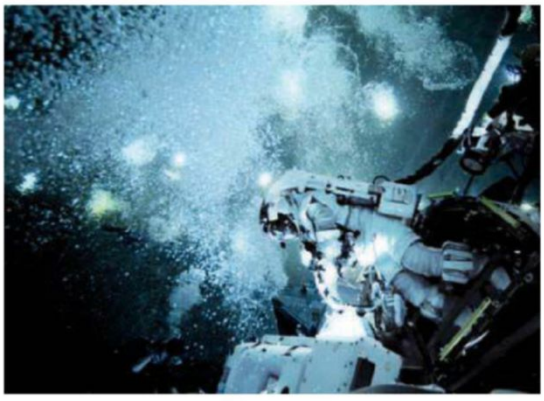
A return to Earth

Six members of the TIME team are traveling to Kazakhstan to cover astronaut Scott Kelly and cosmonaut Mikhail Kornienko's return from a year aboard the International Space Station, a mission TIME has been following since its very beginning. The latest two episodes of our video series A Year in Space *are now available at time.com/space—and a one-hour special tracing the mission from training to landing airs on PBS on March 2 at 8 p.m. E.T.*



What you said about ...

THE MILLENNIAL VOTE Paul Taylor's Feb. 22–29 story on politically disengaged millennials angered some readers from older generations. Norman Gaines of Hartsdale, N.Y., called the problem a "self-created catch-22 of believing your vote won't matter and then not voting" that "will doom this generation to a future in which they exercised no choices." But this problem isn't new. Tim Bloomquist of Traverse City, Mich., wrote with regret of his failure to do more in 1972 to support George McGovern over Richard Nixon—and expressed hope that young voters might learn from that past. "Millennials, show the generation before you that you are paying attention," he wrote. "Change the world."

BONUS *TIME* MOTTO

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When fencer Ibtihaj Muhammad *(left)* competes at the Olympics in Rio de Janeiro this summer, she will become the first Team USA athlete to sport a hijab. Muhammad hopes to inspire young Muslim girls to follow her lead. "If I had people who could challenge that notion that I didn't belong," she tells TIME, "it definitely would have been easier." Read her story at time.com/fencer.

Letters should include the writer's full name, address and home telephone and may be edited for purposes of clarity and space

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SCAN TO DISCOVER MORE

SINGAPORE AIRLINES
A great way to fly

A STAR ALLIANCE MEMBER

‘The FBI is creating a world where citizens rely on Apple to defend their rights.’

EDWARD SNOWDEN, former NSA contractor who faces charges for national-security leaks, defending Apple after it defied the FBI’s demand for help breaking into an iPhone that belonged to one of the San Bernardino, Calif., shooters

Airplanes
Deadly air accidents in 2015 were significantly below the five-year average

GOOD WEEK
BAD WEEK

Hoverboards
A U.S. regulator said consumers “risk serious injury or death” on the scooters

‘I WANT TO LISTEN TO AS MANY DIFFERENT WOMEN IN THE WORLD AS I CAN.’

EMMA WATSON, actor, announcing that she will take a year off from acting to focus her energy on feminist activism

$35,000

Final price paid at auction for a **lock of John Lennon’s hair** that was cut from the Beatles legend’s head by a German barber in 1966

28%

Percentage of **speaking roles featuring nonwhite actors** in over 400 major movies and TV shows from 2014 to 2015, according to a comprehensive new report on diversity in Hollywood. Only a third of speaking roles were played by women

‘AVOIDING PREGNANCY IS NOT AN ABSOLUTE EVIL.’

POPE FRANCIS, suggesting that using birth control amid the Zika outbreak in the Americas may not violate church doctrine against contraception

‘This will be a once-in-a-generation moment to shape the destiny of our country.’

DAVID CAMERON, British Prime Minister, asking Britons to vote to stay in the E.U. in a June referendum

33

Pounds of cocaine (15 kg) a suspected drug courier was caught carrying in his luggage at a German airport

‘By the grace of God, we ended up canceling the Uber.’

CARMEN MORREN, who was scheduled to be Jason Dalton’s passenger before her plans changed on the night he allegedly shot and killed six people in Kalamazoo, Mich.

SOURCES: AP; NEW YORK TIMES; PAPER MAGAZINE

GETTY IMAGES (6); ILLUSTRATIONS BY BROWN BIRD DESIGN FOR TIME

The Brief

'BRITISH VOTERS WILL PROBABLY CHOOSE TO STAY IN THE E.U. BUT THIS IS NO SURE THING.' —PAGE 14

As Super Tuesday looms, Ted Cruz and Marco Rubio have lost valuable ground to Donald Trump

REUTERS

POLITICS

The GOP's last, best chance to trump Trump

By Michael Scherer and Zeke J. Miller/Las Vegas

CAMPAIGNS ARE SUPPOSED TO MAKE the choices clear, but the first 11 months of the Republican nomination fight felt a lot more like chaos, with so many candidates that the debate stage split in two and *Saturday Night Live* struggled to staff skits. Insult tweets triumphed over policy positions, and the spectacle was, well, spectacular.

The states that have already voted—Iowa, New Hampshire, South Carolina and Nevada—have awarded just 133 of the 1,237 delegates needed to win the nomination. But the intense early hand-to-hand contests have narrowed down the unruly field. And three radically different men have emerged with plausible paths to the nomination.

Donald Trump, as he never stops reminding the nation, leads the pack, demonstrating that he is more than just a media fad or reality showman. His brand of postideological triumphalism makes a message out of dominance and turns winning into a conviction, stoking nationalist and nativist fury in a way not seen in this country for generations. Though he hasn't shown he can win a majority of GOP voters in any contest or poll, he is on track to win the nomination absent a shake-up in the race. He easily captured victory in three out of four contests, and record turnout gave him more votes in Nevada than his next two rivals combined.

The two men angling to take him out have résumés that suggest they might be doppelgängers: both Tea Party darlings; both conservative Americans of Cuban descent; born five months apart, Cruz in 1970 and

PHOTOGRAPH BY JONATHAN ERNST

Rubio in 1971; both freshman Senators with little claim on executive experience. But their designs for the nation, in both policy and strategy, reveal a sharp contrast.

Rubio's offer is the future, a youthful rainbow coalition he showcased with his second-place finish in South Carolina, where he stood onstage next to Indian-American governor Nikki Haley and African-American Senator Tim Scott. "We are the party of everyone," he said, on his way to his distant second-place finish in Nevada. "I will never divide our country to win an election."

Cruz sells something very different, a no-surrender return to partisan and cultural war paint. His promised path to general-election victory makes almost no appeal to moderates or racial minorities. Instead he seeks to turn out millions of conservative white voters who have sat out past elections, with appeals based in talk-radio outrage, ideological purity and religious devotion. "The screaming you hear now from across the Potomac is the Washington cartel in full terror that the conservative grassroots are rising up," he said as the South Carolina results placed him third.

Though the path to 1,237 delegates is long, the longer Trump stays in front, the harder it will be to defeat him outright. Only 16% of the delegates will be awarded by winner-take-all states, making it progressively harder for the front runner to be overtaken. For this reason, the campaigns have been preparing to fight it out at the convention. If Trump can be denied 1,237, the remaining candidates can converge around an alternative, empowering other candidates still in the race, retired neurosurgeon Ben Carson and Ohio Governor John Kasich, as possible power brokers.

The most immediate project for the stop-Trump forces is painfully simple: find a convincing argument that Trump would be a worse nominee, something no Republican has been able to do yet. Strategists on the sidelines have been tearing their hair in frustration as Cruz and Rubio and other candidates focus on the battle for second. "No one is organizing a campaign with different message hits each day. No one has brought in victims of his bankruptcies, gone to Atlantic City and held press conferences, attacked him on cultural stuff," says Stuart Stevens, the top strategist for Mitt Romney's 2012 campaign. "It's mind-boggling."

As politics often is. These contests are designed to be brutal passion plays, the best alternative to the bloody wars of succession humanity used in centuries past. But the rules are the same. The only way to win is to win, and only one man has shown he knows this. "We're winning, winning, winning the country," Trump declared after Nevada. "And soon the country's going to start winning, winning, winning." ◻

CAMPAIGN 2016

Face-off: Ted Cruz vs. Marco Rubio

Freshman Senators Cruz and Rubio, both of Cuban descent, have emerged as the chief rivals to Republican front runner Donald Trump. But that doesn't mean they always agree. Here's how their stances diverge—and overlap—on key issues. —*Philip Elliott*

Cruz		Rubio
Cruz would replace almost all federal taxes—and loopholes—with a single 16% VAT on business revenues and a 10% tax on personal income.	**Taxes** *Both plans are likely to raise deficits.*	Rubio would consolidate the current seven tax brackets to three, with top earners paying 35% and businesses 25%. He would also nix taxes on investments.
Cruz opposes any path to citizenship or legal status for immigrants in the U.S. illegally and would push to deport them through existing law-enforcement measures.	**Immigration** *Both candidates promise to secure the border by building a wall, imposing new employment screening and hiring new border agents.*	Rubio supports a long and difficult path to citizenship for immigrants in the country illegally and would delay revoking the legal work status for many undocumented minors.
Cruz opposes any military moves without Congress's approval. He's voted against arming Syrians to fight ISIS and does not want to put Americans on the ground. He wants to "carpet bomb" the enemy.	**ISIS** *Both candidates use strong language to go after perhaps the biggest national-security threat facing the next President.*	Rubio says the President doesn't need approval from Congress to use the military against ISIS and supports sending arms to the Syrians. He also expects to send in some U.S. troops.
Cruz is considered one of the most disliked—and obstructionist—U.S. Senators by peers in both parties. He promises to break the "Washington cartel" of the professional political class.	**Compromise** *Both candidates would face heavy opposition from Democrats in Congress as President.*	Rubio has had success working across party lines, as he did on the failed Gang of Eight immigration bill and other pieces of legislation that originated in Democratic offices.

CRUZ, MIGRATION: AP; RUBIO, PROTESTS, ENVIRONMENT: GETTY IMAGES

MARRIED EN MASSE Roughly 3,000 couples from around the world were married at a single ceremony in South Korea on Feb. 20, with 12,000 more couples participating online. The wedding took place at the Gapyeong headquarters of the Unification Church, which has held mass weddings since the early 1960s. Some of the brides and grooms met only a few days earlier. *Photograph by Jung Yeon-Je—AFP/Getty Images*

ROUNDUP

The countries where ISIS is growing in Africa

THE U.S. IS SCALING UP MILITARY OPERATIONS against ISIS's affiliate group in Libya, which has grown into the power vacuum left by the fall of the Gaddafi regime. U.S. air strikes killed 43 at an ISIS training camp on Feb. 19, likely including a high-level operative who helped plan attacks in Tunisia, and Italy said Feb. 22 that it will allow the U.S. to launch drone attacks on Libya from a Sicilian air base. Here are the key areas where ISIS and its affiliates are gaining a foothold in northern Africa:

LIBYA The group has taken control of over 150 miles of coastline from its base in Sirt and now boasts 6,500 members, including senior operatives from Syria and new recruits from militants in Niger and a cell in Mali. On Feb. 24, militants stormed the western city of Sabratha and beheaded 12 security officers. A related cell in neighboring Morocco was caught on Feb. 18 plotting a chemical attack, while Algerian affiliates are also increasingly active.

EGYPT After proclaiming allegiance to ISIS in late 2014, the Sinai Province has carried out frequent attacks on security forces in Sinai and Cairo. The group claimed the beheading of a Croatian man in August and planted a bomb on a Russian jet that killed 224 in October.

NIGERIA Islamist extremist group Boko Haram pledged allegiance to ISIS in 2015, and despite losing territory in the months since, it continues to make frequent, deadly incursions in northern Nigeria and neighboring states like Chad and Cameroon. —TARA JOHN

TRENDING

MIGRATION
Over **110,000 people crossed the Mediterranean into Greece and Italy** in the first two months of 2016, roughly the same as in the first half of last year. Aid agency IOM said half of those arriving in Greece were Syrians and one-fourth came from Afghanistan.

PROTESTS
Millions of people in New Delhi **were without water for at least five days** after Feb. 20, when demonstrators sabotaged a major canal during violent protests over job quotas. The water supply has been partly restored since the army took control of the canal.

ENVIRONMENT
Global sea levels likely rose **faster in the 20th century than in any of the 27 previous centuries,** according to a new study by 10 climate scientists, which also forecast increases of up to 4 ft. (1.2 m) by the end of the century if greenhouse-gas emissions are not curbed.

TRENDING

LAW

A St. Louis jury ordered pharmaceutical company Johnson & Johnson to **pay $72 million to the family of a woman who died of ovarian cancer, which has been linked to talcum powder.** Though the research is mixed, some studies show that women who regularly use talc-based body powder on their genitals are at increased risk for ovarian cancer. J&J is expected to appeal the verdict.

FOREIGN POLICY

On Feb. 23, President Obama sent Congress **a plan to close the prison in Guantánamo Bay, Cuba,** more than seven years after signing an order to shut it. It would require a change in law to allow detainees to be housed on U.S. soil, which most Republicans oppose.

CRIME

The Egyptian military said Feb. 21 that **the sentencing of a 3-year-old boy to life in jail** by an Egyptian court was the result of mistaken identity. The case revived criticism of Egypt's wholesale roundups of critics after the 2014 military takeover.

THE RISK REPORT

What a U.K. exit from the E.U. could mean

By Ian Bremmer

PERHAPS U.K. PRIME MINISTER DAVID Cameron believed back in 2013, when he promised a referendum on whether Britain would stay in the E.U., that Euroskeptics couldn't possibly win. But much has changed since, and though a majority of those voting in the June 23 referendum are likely to want to keep Britain in the union, the risk is real that a surge of fear over migrants, or a terrorist attack, could tip the scales toward an "out" vote. And that would have major implications for Britain, Europe and the world.

A vote to leave would force the British government to renegotiate trade and investment relationships with other E.U. members. Over time, Britain might secure access to E.U. markets for its goods on fairly favorable terms, but European leaders would make the process as arduous and painful as possible to discourage other E.U. states from threatening exit to win concessions. Two years of negotiations—at least—would generate enough uncertainty to create serious problems for Britain's growth and investment outlook.

It would prove much more difficult to win access to European services markets. In the financial sector, E.U. leaders aren't likely to accept a continuing role for London as the major financial center in Europe, particularly for euro-zone financial products. Brexit might carry a heavy political cost as well, because it could give Scottish nationalists the argument and energy they need not only to hold another vote on Scottish independence from the U.K. but to win this time.

Brexit would also damage Europe, especially at first. In time, it's possible that a U.K. exit would make it easier for E.U. leaders to move forward with treaty changes, traditionally resisted by the British, that would allow for closer union, possibly even of fiscal policy. In the meantime, however, losing Britain would hurt. The U.K. is the second biggest contributor to the E.U.'s budget, after Germany. Losing the U.K. could cost the E.U. 15% of its GDP.

More worrisome, Britain is not the only E.U. member ambivalent about staying within the union. The Brexit precedent could pose a major threat to Europe's open borders, the euro zone, even the entire European project. It would surely weaken efforts to strengthen damaged European-U.S. ties and undermine efforts to complete a historic transatlantic trade-and-investment agreement.

> Brexit would have major implications for Britain, Europe and the world

In the end, a majority of British voters will probably choose to stay in the E.U. But this is no sure thing. London Mayor Boris Johnson announced on Feb. 21 that he will support a vote for Brexit, and though his calculation is surely driven more by a bid to win Conservative Party support to become Prime Minister than by any genuine conviction, he's playing with fire. When it comes to Brexit, no one can be confident of the outcome. □

EXPLAINER

China's war on the media

On Feb. 19, China's President Xi Jinping visited the offices of the nation's biggest media outlets to demand that journalists "speak for the [Communist] Party's will" and to order them to undergo Marxist training. This is just the latest incident in Xi's mounting assault on already limited press freedoms.

—Hannah Beech/Shanghai

COPY APPROVAL

New rules forbid foreign companies from publishing "informational or thoughtful" online content within China unless preapproved by the government. U.S. giants from Dow Jones to Apple could be affected.

CLOSED INTERNET

Xi has called for Internet sovereignty, the idea of restricting the free flow of online data across national borders. Recent legislation criminalizes any digital content that could be deemed a national-security threat.

JAILED JOURNOS

In 2015, China had the largest number of reporters behind bars of any nation, according to the Committee to Protect Journalists. Bloggers and writers can be jailed for any reporting considered to cause "serious social disorder."

Milestones

DIED

Umberto Eco, 84, Italian literary giant and author of best-selling novels like *The Name of the Rose.*

› James "Sonny James" Loden, 87, country-music star best known for his 1956 hit "Young Love." He had 16 consecutive No. 1 singles.

› Angela "Big Ang" Raiola, 55, star of VH1's reality-TV show *Mob Wives* and niece of Salvatore Lombardi of the Genovese crime family.

ANNOUNCED

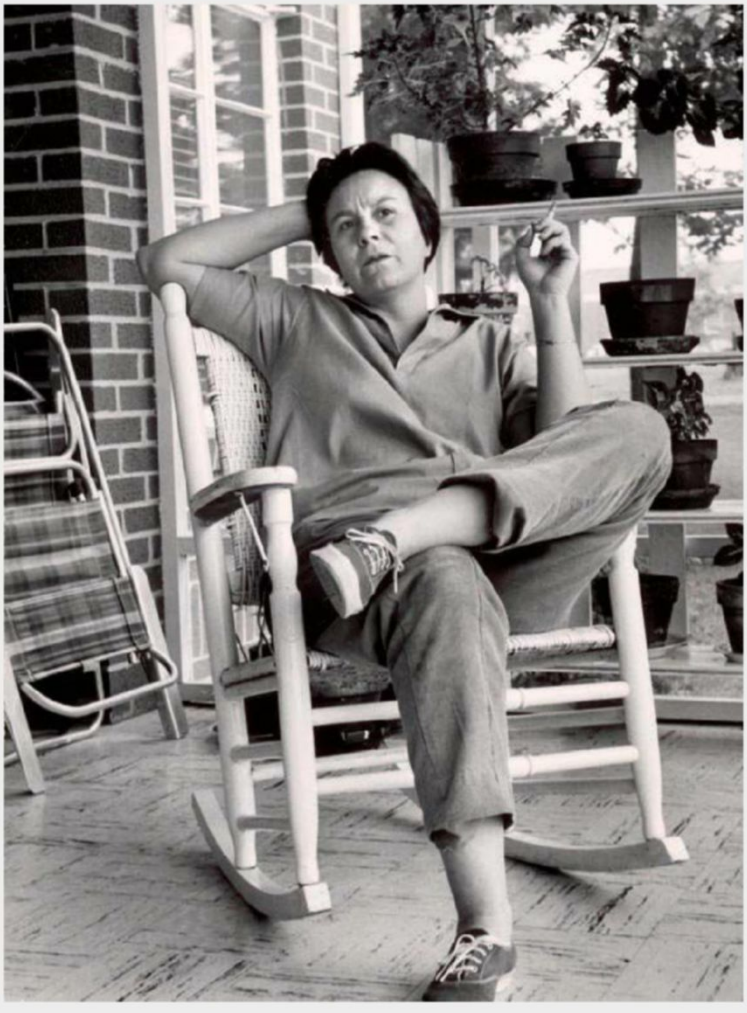
By Missouri Democratic Senator **Claire McCaskill,** that she has breast cancer and will take a leave to undergo treatment.

RECALLED

By the candy company Mars, **chocolate bars in 55 countries**—mostly in Europe—after plastic was discovered in a Snickers bar in Germany. Affected products were made at a factory in the Netherlands.

WON

The Daytona 500, by Denny Hamlin, by just 0.01 seconds, the smallest margin of victory in the event's 58-year history. It was also the first won in a Toyota.



Lee, a keen observer of Southern mores, won the 1961 Pulitzer Prize

DIED

Harper Lee

America's literary conscience

HARPER LEE MADE HER MARK EARLY ON. AFTER SHE PUBLISHED *To Kill a Mockingbird* in 1960, she lived quietly in Monroeville, Ala., until her death Feb. 19 at 89. The book tends to enter readers' lives early too. *Mockingbird* is a simple story of childhood, but its harsher truths about race in America are complicated enough to reward many rereadings over the course of a lifetime.

This became yet more apparent after last year's release of the purported sequel *Go Set a Watchman,* in which *Mockingbird*'s fair-minded lawyer Atticus Finch is revealed as a racist. Reader outrage ratified the power and impact of Lee's writing. And the fact that Finch could so convincingly bear both heroism and racial animus proved the clear-sighted genius of a woman for whom the Old South was both morally indefensible and home. —DANIEL D'ADDARIO

DIED

Boutros Boutros-Ghali

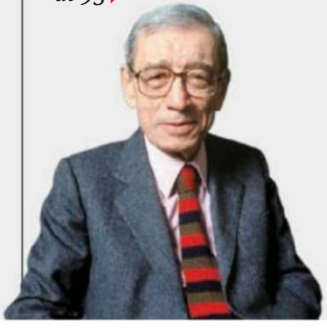
By Kofi Annan

BOUTROS BOUTROS-Ghali took the helm of the United Nations at a pivotal time. The end of the Cold War brought new hope, but we quickly realized this brave new world would be far more difficult to manage than we had imagined.

With characteristic directness and intellectual agility, Boutros sought to confront and overcome the complex challenges of the day. It was on his watch that the Agenda for Peace was launched, making the case for preventive diplomacy. He will be remembered for helping prepare the U.N. for a world where states would no longer be able to control or suppress the forces and furies that ensnare them.

Annan, a former U.N. Secretary-General, is the chair of the Kofi Annan Foundation

Boutros-Ghali died Feb. 16 at 93 ›



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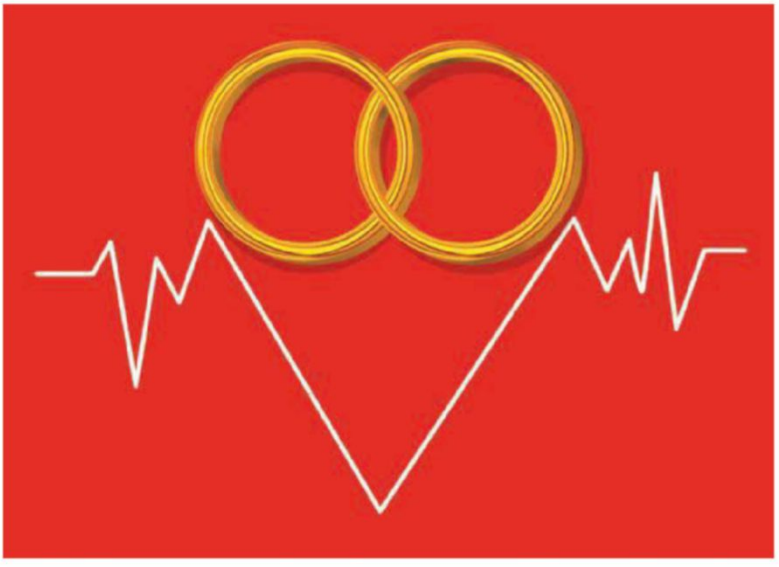
HEALTH NEWS

How marriage can influence your blood pressure

By Belinda Luscombe



CAN A LOUSY MARRIAGE ACTUALLY BREAK YOUR heart? Or a good marriage mend it? Increasingly, researchers are finding that cardiac health and the happiness of our relationships are dance partners. Researchers have long known that married people tend to live longer and be healthier than their single peers. Some of the reasons for that are not mysterious: married people are more likely to have someone who's keeping an eye on them, who notices when they're unwell, who can pick up their medications or take them to the doctor.

But new research suggests that the benefit isn't simply having someone around to call 911 in an emergency—the quality of the marriage makes a difference too. A 2015 University of Michigan study followed more than 1,300 couples over six years and found that bad marriages can affect heart health. When a wife is stressed, the study found, her husband's systolic blood pressure tended to go up. If both spouses thought the marriage wasn't going well, the husband's blood pressure spiked even more. The effect was different for wives: their blood-pressure readings were higher if the relationship was going badly. But if their husbands were reporting more stress, the wives' blood pressure tended to drop.

Why the inverse relationship? "Husbands tend to rely on spouses for support, which may not be provided when wives are experiencing high levels of stress," says the report. Wives, on the other hand, find support from a wider network of sources, say the researchers, so if their spouse is unable to offer them succor, they have more places to turn.

Some researchers are also looking at marriages that are neither deliriously happy nor unhappy but somewhere in between. A recent study out of Brigham Young University found that people whose marriages were ambivalent—with a significant amount of negative interaction as well as some positive—consistently had higher blood pressure than those who said their marriages were very satisfying. Worse, those nasty exchanges erased the cardiovascular bump that the positive exchanges gave them.

So while a good marriage is good for hearts, it takes work. Another study found that both husbands and wives who fought more had thicker carotid arteries. It's not clear which came first, the harsh words or the thickening, but it certainly brings new meaning to the term *hard-hearted.*

200%
Increase in likelihood that a woman divorced twice or more will have a heart attack, compared with her stably married peers

8.5%
Increase in risk that spouses who say more negative than positive things to each other will have a heart event

+2.3%
Difference in average BMI of married vs. unmarried European men of the same age

The marriage-weight link

Among the many things that marriage changes is people's consumption habits. Studies suggest they become healthier and drink less alcohol. At the same time, a 2015 study found that although newlyweds ate better—they bought more regional and unprocessed food and less prepackaged and takeout—they were also less fit. Researchers in Switzerland looked at the body mass index of 10,000 Europeans and discovered that it was higher in married couples in every country they studied. On average, married people were about 4.4 lb. (2 kg) heavier than singles. The reason: single people were more physically active, probably because they used sports as a way to socialize. Married folks' social needs, on the other hand, tend to be met at home. The solution? For spouses to find an activity to do together.

Heart-attack recovery

MARRIED PEOPLE SURVIVE HEART attacks more often than single people, and a new study has noted another bonus: they bounce back better too.

University of Pennsylvania researchers found that spouses who had major cardiac surgery had better functional recovery within two years than patients who were divorced, separated or widowed. That means they were more able to get dressed, bathe or go to the bathroom on their own. In fact, those who were no longer married were about 40% more likely to die or develop a new functional disability in the first two years postsurgery than those with a spouse at home. (There were not enough never-married people in the study to make an assessment on them.)

The researchers are not sure whether the results are because less-healthy people are more likely to be unmarried or because spouses make a big difference in rehabilitation. Either way, they say hospitals should consider marital status when helping people plan their post-heart-attack life.

ILLUSTRATION BY OLIVER MUNDAY FOR TIME

SOURCES: DUKE UNIVERSITY MEDICAL CENTER; UNIVERSITY OF PITTSBURGH STUDY 2013; UNIVERSITY OF BASEL STUDY 2015

LightBox

Up in smoke

Security officials wear gas masks inside the parliament building in Pristina, Kosovo, on Feb. 19 after opposition lawmakers seeking snap elections released tear gas in protest of diplomatic deals with Serbia and Montenegro. Pepper spray and whistles have been used in past disruptions.

Photograph by Armend Nimani—AFP/Getty Images

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1 in 5 children faces hunger.

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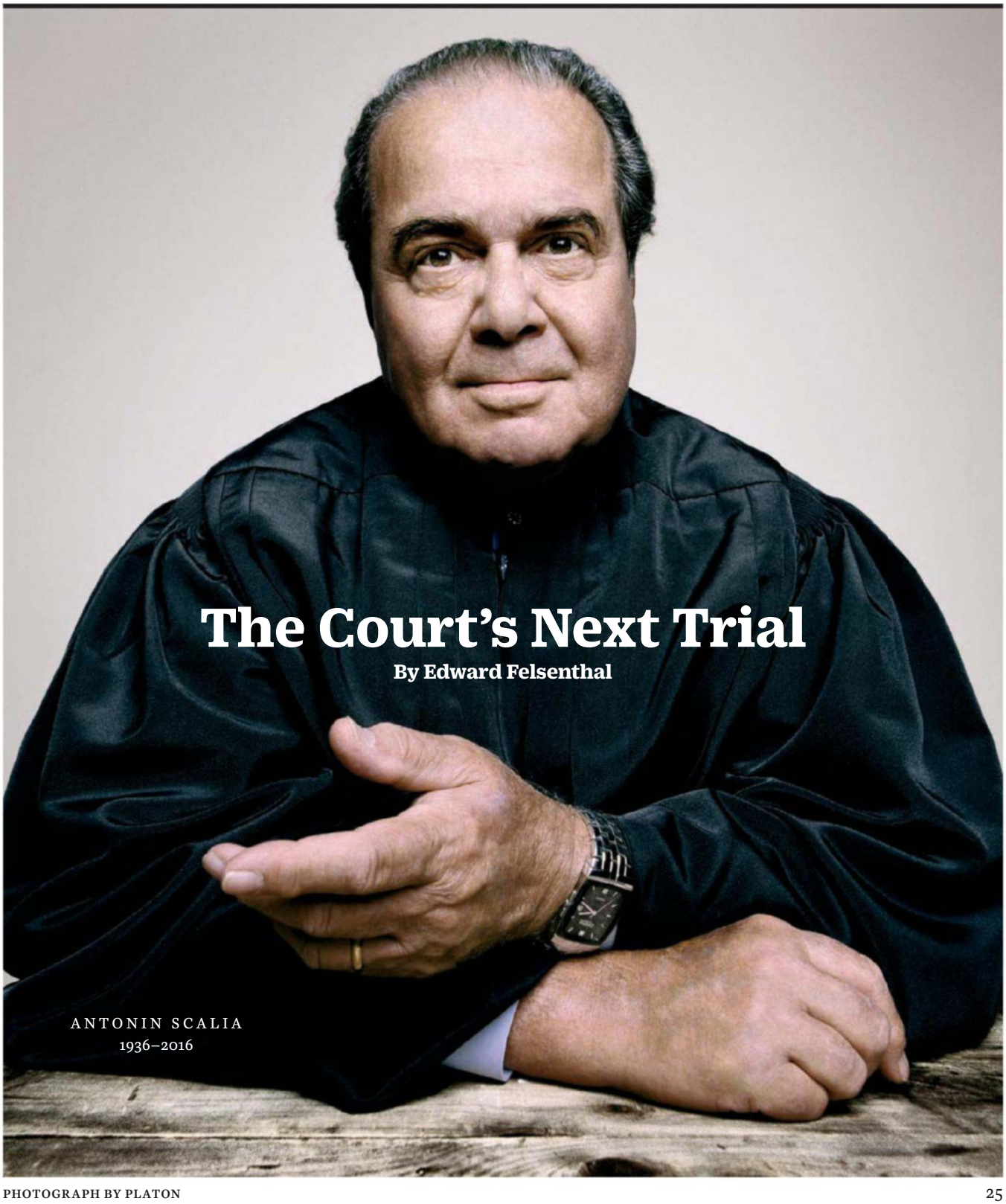
The View

'[IT'S] FRUSTRATING TO SEE WOMEN COME FORWARD WITH THEIR PAST ONLY TO BE SHOT DOWN … AND DISRESPECTED.' —PAGE 31



The Court's Next Trial

By Edward Felsenthal

ANTONIN SCALIA
1936–2016

TRUNK ARCHIVE

PHOTOGRAPH BY PLATON

"REALITY HAS OVERTAKEN PARODY," Antonin Scalia liked to say during his fiery 30-year tenure on America's highest court. It was a quip typically hurled at judges who diverged from Scalia's own philosophy, but it also encapsulated his dismay at much of the culture surrounding him. He dismissed the rulings of colleagues as "tutti-frutti opinion" and "argle-bargle." He scoffed at "homosexual activists." He deplored "sandal-wearing, scruffy-bearded weirdo[s]" who burned American flags (even as he upheld their right to do so).

"I'm normal," Scalia once said. "Everyone else is crazy."

And so it would hardly have surprised the brilliant and irascible jurist that mere hours after he was found dead on a Saturday morning in a quiet quarter of the West Texas mountains, a circus was already unfolding.

The show began within minutes of Texas Governor Greg Abbott's publicly confirming Scalia's death, when the communications director for Republican Senator Mike Lee of Utah tweeted, "What is less than zero? The chances of Obama successfully appointing a Supreme Court justice." Senate minority leader Harry Reid responded that a delay in replacing Scalia would be "a shameful abdication of one of the Senate's most essential constitutional responsibilities." Ted Cruz's Facebook page flooded with comments predicting that Barack Obama would now "attempt to destroy America once and for all" and the like, while the liberal sometime anchor Keith Olbermann pronounced Scalia's death an "Improvement!"

This was all far off the official script for an institution that—rightly or wrongly, and it is often the latter—thinks of itself as above politics. But many close to the court viewed it with foreboding. "If the depressing deathwatch is the best we can do, I for one would rather go without a Supreme Court," wrote Stephen Carter, a Yale law professor and author who once clerked on the court. "Seriously."

It isn't inevitable that the fight over replacing Scalia will end in gridlock, but it's close. While Senate majority leader Mitch McConnell insists he has no intention of considering any White House nominee, there are seven Republican Senators up for re-election in states that Obama won at least once. Two of those Senators have already come out in favor of allowing hearings. If Obama selects a candidate with admirers on both sides of the aisle—the White House is reportedly vetting centrist Republican Governor Brian Sandoval of Nevada—moderates and vulnerable Republicans could potentially force McConnell to allow hearings. Fifty-six percent of Americans agree and want the Senate to hold a hearing, according to a recent Pew poll. Whether the seat is filled by Obama or his successor, the stakes have rarely been higher, with the ideological balance, the reputation and in some ways the very authority of the court on trial.

IT IS NO ACCIDENT that the nine—now eight, for the foreseeable future—judges who make up the Supreme Court of the United States go to work each day in a building that looks like a temple. It was designed that way, to reflect the court's exalted role as the branch of government most likely to bend toward justice. And while no court has ever been devoid of politics, the Supreme Court has historically resisted the partisan excesses seen in the neighborhood's other buildings.

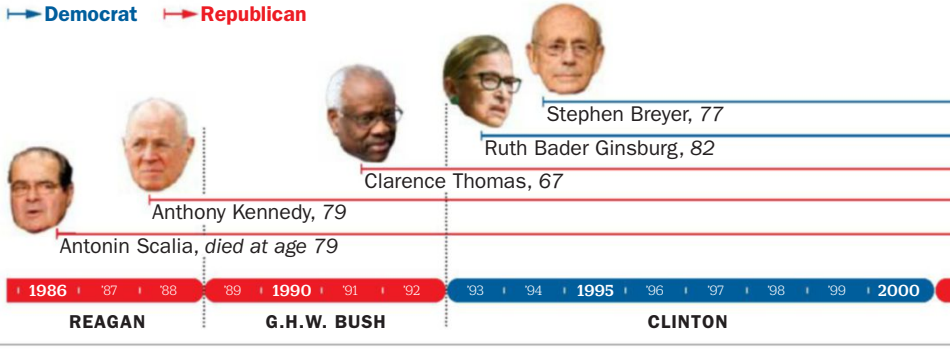
The past three decades, coinciding largely with the Scalia tenure, have put that tendency to the test. It is not only that 5-4 decisions are now often the rule in cases of highest national impact. For the first time in modern history, those splits are now essentially along partisan divides. Justice John Paul Stevens, a Republican appointee who consistently voted with the court's liberal wing, was the last member of the court to regularly cross lines in cases with political or ideological overtones. A study from William and Mary Law School noted that in the 220 years prior to Stevens' retirement in 2010, only two decisions designated as "important" (and that had at least two dissenting votes) split along party lines. Over the 2010–12 terms alone, there were five that fit that bill.

In many ways the coming fight over replacing Scalia is a natural extension of his legacy. A bon vivant, sought-after public speaker and unparalleled writer who charmed many an opponent—Justice Elena Kagan, an Obama appointee who had never owned a gun before, became a hunting buddy—Scalia became by far the most famous Justice on the bench. Through his opinions and positions, he helped turn the court into a battleground—a place to fight back against, or fight to preserve, the judicial activism of earlier eras. He was best known for his dissents, for his love of a brawl, for his denouncements. It is this spirit—that interpreting the Constitution is about right and wrong, deception and truth—that will make replacing him so contentious in the coming months. "It's hard to believe this," the Justice said in 2012. "I was confirmed by a vote of 98 to nothing. Me!" That could never happen again, and Scalia, who described some fellow judges as "Mullahs of the West," helped make it so.

"I don't think in American history there ever has been such a sharp juris-

Roots of the court

The current court was shaped by five Presidents. Here's a look at when each Justice was appointed and by whom, along with their current age



Scalia, right, with Federal Reserve Board Chairman Alan Greenspan in 2001

prudential, philosophic, methodological difference between first-rate educated judges who are out of the Republican tradition and those out of the Democratic tradition," says Laurence Silberman, one of the longest-serving judges on the D.C. Court of Appeals and Scalia's close friend. "Scalia," he adds, "was sort of the paradigmatic figure in that."

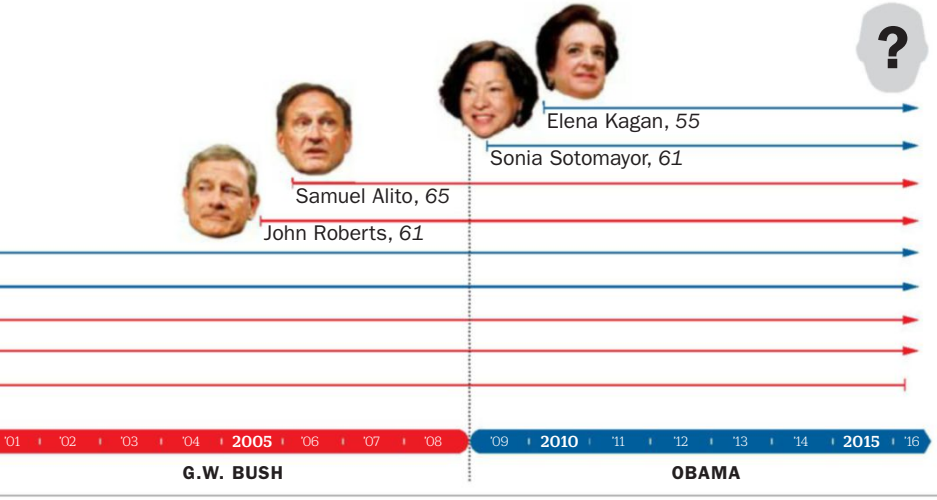
SCALIA BEGAN SHAKING UP the staid, hierarchical Supreme Court from the moment he sat down for his first oral argument in the far-right chair that is reserved for the most junior Justice. As the lawyers presented their cases, he didn't just ask questions of them—he more or less opened fire. "Do you think he knows that the rest of us are here?" Justice Lewis Powell whispered to Thurgood Marshall, according to John C. Jeffries' biography of Powell.

With the exception of Clarence Thomas, who has not asked a question from the bench in about 10 years, Scalia's approach gradually became almost the norm. "He radically changed oral argument," says Tom Goldstein, a lawyer who argues frequently before the court and co-founded the popular court-watching site Scotusblog. Though the sessions are undeniably more engaging and penetrating than they once were, with eight Justices and at least two lawyers vying for time and talking over one another, they can take on the feel of a crowded presidential debate stage. "Just say 'bingo' or something" when you find it, Scalia said to a lawyer who was searching his papers to find the answer to a question. In a 2010 First Amendment case, Justice Samuel Alito, mocking Scalia's originalism, said to a lawyer, "I think what Justice Scalia wants to know is what James Madison thought about video games." A few years ago, Kagan cut off a former Solicitor General before he got 10 words out. "We look like *Family Feud*," Thomas told a group of Richmond, Va., lawyers, endeavoring to explain his own silence.

Scalia's biggest legacy by far came from his famed dissents, which he said he wrote for law students. But his singeing language also gave voice to the right on topics from immigration to gay rights. It "boggles the mind," Scalia wrote in a 2012 case, that the majority wouldn't let Arizona enforce immigration laws "that the president declines to enforce." He went on to wonder if any state would have even joined the union if they had known what was coming. Critics noted that his reference to Obama policy was gratuitous, since it wasn't even part of the case. "The nation is in the midst of a hard-fought presidential election campaign; the outcome is in doubt. Illegal immigration is a campaign issue. It wouldn't surprise me if Justice Scalia's opinion were quoted in campaign ads," Richard Posner, a onetime friend and conservative appeals-court judge who became increasingly critical of Scalia, wrote at the time.

In last year's case upholding Obamacare, just as Ruth Bader Ginsburg did in the 2000 case that handed George W. Bush the presidency, Scalia notably signed off with "I dissent" rather than the more traditional "I respectfully dissent." A day later, he called the ruling in favor of gay marriage a "judicial Putsch," adding that he would rather "hide my head in a bag" than join the majority.

Says Goldstein: "If a member of the Supreme Court says its decisions are illegitimate, well, you've got to expect the public to listen."



ONE CASUALTY OF THE COURT'S sharpened philosophical and partisan

GREENSPAN AND SCALIA: GETTY IMAGES; JUSTICES: AP (5), GETTY IMAGES (3), REUTERS

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divides has been consensus building. And while every member of the court owns some responsibility for that, Scalia seemed to have special disdain for compromise. "I prefer not to take part in the assembling of an apparent but specious unanimity," he wrote in a separate opinion in a 9-0 case striking down a Massachusetts restriction on abortion protesters. When Scalia was nominated, many thought he would, in part because of his charm, forge conservative majorities the way the late William Brennan had cobbled them together on the left. But Scalia soon showed he would rather lose than muddle his opinion. "He didn't care as much about the result," says Silberman. "He cared about the reasoning."

That may be admirable for a judge seeking to shape history. ("I write my dissents for casebooks. There's no other reason to write them," Scalia said.) But it is a tough recipe for a court that aims to be a redoubt from the fray in an increasingly frayed democracy. As an institution that exists to resolve problems, a now retired member of the court once said, "there's a strong obligation to try to bend." Or as Chief Justice John Roberts put it in his own nomination hearings, "You do have to be open to the considered views of your colleagues." He added that a priority of any Chief Justice should be to "bring about a greater degree of coherence and consensus."

Consensus has had its moments in the 11 years since Roberts took his chair at the center of the bench, from the two-thirds of cases that were unanimous in the 2013–14 term to the Roberts-led majority in the Obamacare case that defied party lines (and for which, as TIME's David Von Drehle put it, he "had to squirm like Houdini to reach middle ground"). It is too early to tell, and may even require undue optimism in this season of vitriol, but perhaps Scalia's departure will boost Roberts' efforts.

Regardless of which President chooses the next Justice, or when he or she is sworn in, the remaining members now have a chance to "take back" the court, not merely from the extremes of Scalia's tongue and pen but also from the broader, uglier partisanship that, having beset the White House and Congress, has been on the verge of taking over the third branch as well. That would mean fewer dissents, more consensus and narrower opinions that take the edge, the partisanship out of the mix to the extent that it is possible. It is an opportunity for the court to get back to what many who revere it want it to be. —*With reporting by* TESSA BERENSON/WASHINGTON *and* JULIA ZORTHIAN/NEW YORK

Felsenthal is the editor of TIME Digital and a former Supreme Court correspondent

VERBATIM

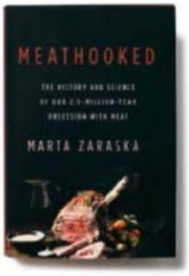
'[It's] frustrating to see women come forward with their past only to be shot down … and disrespected for their bravery.'

DEMI LOVATO, pop star, on "Tik Tok" singer Kesha, who has accused her main producer, Dr. Luke, of verbal, sexual and emotional abuse, and has requested release from his Sony-owned label. (Luke denies the charges.) Kesha's request for a preliminary injunction was denied on Feb. 19

LOVATO—EPA

NUTSHELL

Meathooked



STUDIES HAVE shown that eating too much meat can lead to heart disease, among other conditions. But if that's the case, why did humans evolve to be carnivorous in the first place? The answer, according to science journalist Marta Zaraska, is that we (kind of) didn't; rather, we evolved *because* we ate meat. Prehumans had a mostly plant-based diet, comprising fruits, leaves and flowers. But some 2.5 million years ago, climate change caused lengthy dry spells over the African savanna, severely limiting many of those calorie sources—and making lions' leftovers, like zebra meat, an appealing alternative (with extra nutrients that helped our brains grow). By 1.8 million years ago, we were hunting game on our own, fostering the kind of teamwork and communication that allowed us to have complex social lives. That know-how also allowed humans to move to continents with less abundant edible plants, which helped our species spread. Today most people don't need meat to survive; there are plenty of nutrient-rich, plant-based foods available. But our taste buds, Zaraska writes, "obviously didn't get the memo."

—SARAH BEGLEY

CHARTOON

Movie-plot generator

choose one from each column

geeky	monkey	plans a heist	on a plane
robot	Jennifer Lawrence	falls in love	somewhere in the Middle East
superhero	dinosaur	time travels	with a bear
edgy	Lincoln	blows stuff up	on Mars
kung-fu	zombie	seeks revenge	at the White House
cartoon	Steve Jobs	finds corruption	in the 1950s
giant	alien	is a cop	with Channing Tatum

JOHN ATKINSON, WRONG HANDS

VIEWPOINT

The real meaning of Apple's battle with the FBI over encryption

By Julian Sanchez

THE FIRST THING TO UNDERSTAND about Apple's ongoing fight with the FBI—over a court order to help unlock the alleged San Bernardino shooter's phone—is that it has very little to do with the San Bernardino shooter's phone.

It's not even really the latest round of the Crypto Wars—the long-running debate about how law-enforcement and intelligence agencies can adapt to the growing ubiquity of uncrackable encryption.

It's actually a fight over the future of high-tech surveillance, the trust infrastructure undergirding the global software ecosystem and how far technology companies and software developers can be conscripted as unwilling suppliers of hacking tools for governments. It's also the public expression of a conflict that will undoubtedly continue in secret, one that is likely already well under way.

First, the specifics of the case. The FBI wants Apple's help in unlocking the work iPhone used by Syed Farook, who authorities believe perpetrated last year's mass killing at an office Christmas party before perishing in a shoot-out with police. It has already obtained information about Farook's activities from Apple's iCloud servers, where much of his data was backed up, and from Facebook. It's unclear whether investigators were able to recover any data from two other gadgets Farook physically destroyed before the attack.

But the most recent data from Farook's work-assigned iPhone 5c wasn't backed up, and the device is locked with a simple numeric pass code that's needed to decrypt the phone's drive. Since it doesn't have to contend with a longer, stronger alphanumeric pass phrase, the FBI could easily "brute force" the pass code—churning through all the possible combinations—in a matter of hours, if only the phone weren't configured to wipe itself after too many wrong guesses, rendering the contents permanently inaccessible.

THE CASE FOR THE FBI

'The only way to find out [if Farook had more information about other possible attacks] is to open up that phone and get in there. A lot of the families of the victims—we're kind of angry and confused as to why Apple is refusing to do this.'

ROBERT VELASCO, father of San Bernardino shooting victim Yvette Velasco

'[The FBI is] not asking for some general thing, they are asking for a particular case ... It is no different than [the question of] should anybody ever have been able to tell the phone company to get information, should anybody be able to get at bank records.'

BILL GATES, Microsoft founder

'Maybe the phone holds the clue to finding more terrorists. Maybe it doesn't. But we can't look the survivors in the eye, or ourselves in the mirror, if we don't follow this lead.'

JAMES COMEY, FBI director

So the bureau wants Apple to develop a custom version of its iOS operating system that permits an unlimited number of rapid guesses at the pass code—and sign it with the company's secret developer key so that it will be recognized by the device as a legitimate software update.

Considered in isolation, the request seems fairly benign. If it were merely a question of whether to unlock a single device—even one unlikely to contain much essential evidence—there would probably be little harm in complying. The reason Apple CEO Tim Cook has pledged to fight a court's order to assist the bureau is that he understands the danger of the underlying legal precedent.

Four important pieces of context are necessary to see the trouble with the Apple order:

1. IT COULD AFFORD the government a way to make tech companies help with investigations. Law-enforcement and intelligence agencies have for years wanted Congress to update the Communications Assistance for Law Enforcement Act of 1994, which spells out the obligations of telephone companies and Internet providers to assist government investigations, to deal with the growing prevalence of encryption—perhaps by requiring companies to build the government back doors into secure devices and messaging apps. In the face of strong opposition from tech companies, security experts and civil-liberties groups, Congress has so far refused.

By falling back on an unprecedentedly broad reading of the 1789 All Writs Act to compel Apple to produce hacking tools, the government is seeking an entry point from the courts it hasn't been able to obtain legislatively. Moreover, saddling companies with an obligation to help break their own security will raise the cost of resisting efforts to mandate vulnerabilities baked in by design.

2. THIS PUBLIC FIGHT could affect secret orders from the government. Several provisions of the federal laws governing digital intelligence surveillance require companies to provide "technical assistance" to spy agencies. Everything we know suggests that government lawyers are likely to argue for an expansive reading of that obligation—and may already have done so. That fight, however, will unfold in secret, through classified arguments before the Foreign Intelligence Surveillance Court. The precedent set in the public fight may help determine how ambitious the government can be in seeking secret orders that would require companies to produce hacking or surveillance tools meant to compromise their devices and applications.

3. THE CONSEQUENCES of a precedent permitting this sort of coding conscription are likely to be enormous in scope. In November, Manhattan district attorney Cyrus Vance said his office alone had encountered 111 Apple devices that it had been unable to open over a one-year period. Once it has been established that Apple can be forced to build one skeleton key, the inevitable flood of similar requests—from governments at all levels, foreign and domestic—could effectively force the firm and peers to develop internal departments dedicated to building spyware for governments, just as many already have full-time compliance teams dedicated to dealing with ordinary search warrants.

This would create an internal conflict of interest: the same company must work to both secure its products and undermine that security. And the better it does the first job, the larger the headaches it creates for itself in doing the second. It would also, as Apple's Cook argues, make it far more difficult to prevent those cracking tools from escaping into the wild or being replicated.

THE CASE FOR APPLE

'We build secure products to keep your information safe, and we give law enforcement access to data based on valid legal orders. But that's wholly different than requiring companies to enable hacking of customer devices and data.'

SUNDAR PICHAI, Google CEO

'[FBI Director James Comey] would like a back door available to American law enforcement in all devices globally. And, frankly, I think on balance that actually harms American safety and security.'

MICHAEL HAYDEN, former NSA director

'This … is about much more than a single phone or a single investigation. At stake is the data security of hundreds of millions of law-abiding people, and setting a dangerous precedent that threatens everyone's civil liberties.'

TIM COOK, Apple CEO

4. MOST OMINOUSLY, the effects of a win for the FBI in this case almost certainly won't be limited to smartphones. Over the past year, I worked with a group of experts at Harvard Law School on a report that predicted governments would respond to the challenges encryption poses by turning to the burgeoning Internet of Things to create a global network of surveillance devices. Armed with code blessed by developers' secret key, governments will be able to deliver spyware in the form of trusted updates to a host of sensor-enabled appliances. Think of not just the webcam and microphone on your laptop but also voice-controlled devices like Amazon's Echo, smart televisions, network routers, wearable computing devices, even Hello Barbie.

The global market for both traditional computing devices and the new breed of networked appliances depends on an underlying ecosystem of trust—trust that security updates pushed out by developers and signed by their cryptographic keys will do what's promised. The developer keys that mark code as trusted are critical to that ecosystem, which will become ever more difficult to sustain if developers can be systematically forced to deploy those keys at the behest of governments. Users and consumers will reasonably be even more distrustful if the scope of governments' ability to demand spyware disguised as authentic updates is determined not by a clear framework but by a hodgepodge of public and secret court decisions.

These, then, are the high stakes of Apple's resistance to the FBI's order: not whether the federal government can read one dead terrorism suspect's phone but whether technology companies can be conscripted to undermine global trust in our computing devices. That's a staggeringly high price to pay for any investigation.

Sanchez is a senior fellow at the Cato Institute, a libertarian think tank

COMEY: AP; COOK: REUTERS

A Michigan shooting spree kindles fear of the Scaring Economy

By Karl Vick

LONG BEFORE THE EXISTENCE OF UBER, THE RIDE-booking service for which Jason Dalton was ferrying passengers around Kalamazoo on Feb. 20—the day he allegedly shot and killed six people—the western-Michigan city maintained a prominent place in the history of automotive livery. For years, Kalamazoo was best known as the home of Checker Motors Corp., maker of the nation's most famous taxicabs.

The squared-off Checker sedan was an American icon, the car you pictured idling at the curb after you hailed a taxi. It puttered in from another time, distinguished by a passenger compartment "as large as a Manhattan living room," as one writer put it, and a driver who harbored fears about who might be back there. In 1968 the company rolled out a model with a built-in bulletproof partition, "scientifically engineered to protect drivers against assaults and holdups," according to the sales brochure, which is available, of course, on eBay.

That website 21 years ago pioneered what's sometimes called the sharing economy but at moments like this feels more like the Scaring Economy. The site helped transform an Internet then largely defined by chat rooms, spam and porn into a platform for exchanges that glide on the assumption of trust—the very quality that the revelations about Dalton's gig as an Uber driver put in question.

THE RISE of the sharing or peer-to-peer economy has been swift and relentless. More than 90 million U.S. adults have taken part in some way, according to a TIME poll from December, hailing rides through Uber, staying in homes rented on Airbnb and receiving packages delivered by Postmates. Given our growing reliance on such services, it's no surprise when something punctures the trust at the core of their business model—even if, in the case of Dalton, Uber actually played no tangible role in the shootings. Indeed, Dalton never so much as threatened his passengers, though one was badly shaken when his driving turned suddenly wild after a mysterious cell-phone call a couple of hours before the first fusillade. Otherwise, the married father of two did his job, picking up and safely delivering fares both before and after allegedly shooting a woman in an apartment-building parking lot. Police say he answered yet another hail after shooting three more people outside a car dealership and four elderly women in a Cracker Barrel parking lot.

We first learned this when passengers posted their invoices on social media. Uber receipts fashioned to provide reassurance and transparency read differently in retrospect: YOUR LAST TRIP and YOU RODE WITH JASON. The "safe rides fee" the company adds to each trip is actually a surcharge to cover Uber's background check on its drivers. In Dalton's case, there was nothing to find—he had no criminal record nor any other legal red flags. "A background check is just that," said Ed Davis, a former Boston police commissioner who serves on Uber's safety-advisory board. "It does not foresee the future."

TRUST FALLS
Nearly all Uber rides and Airbnb rentals go off without a hitch. But Uber driver and alleged shooter **Jason Dalton** is just one reminder that risks do persist:

A former Uber driver in Boston was **convicted of kidnapping and raping a woman who used the app to hail a ride** in December 2014.

After watching this year's Super Bowl at a bar, **a California Uber driver was charged with DUI while on his way to pick up a fare.**

An American man was **hospitalized after being mauled by his Airbnb host's Rottweiler** in Argentina last March. The listing did not mention the animal.

But that's only part of the problem. Peer-to-peer business is a lot of things—mobilizer of underused assets, enforcer of new efficiencies and, often, employer of last resort. Some cabbies make a career hacking. But the long hours and low pay make it a fallback for new immigrants and anyone whose prospects have faded. And though it's impossible to know how anyone will behave in a closed metal box with a stranger, an aspiring cabbie in New York City must be fingerprinted and drug tested, sit through training videos and, not least, present himself in person to licensers. Uber does not collect fingerprints or any other biometric assurance that an applicant is who he says he is. Its scan of public records looks back only seven years; law-enforcement checks typically reach back 25.

FOR THE WORLD'S most valuable startup, a firm known for its swagger, Dalton's case presents a delicate test. Right now, no one from Uber meets a new driver before the passenger does. That flips the assumption of risk that led Checker to safeguard cabbies almost 50 years ago.

Many people in TIME's poll thought startups are exploiting a lack of regulation, and the unease over Kalamazoo implies an appetite for balancing that. Riding with Uber or its chief rival, Lyft, is almost a frictionless transaction: the fare is paid in advance, on the app, eliminating the tension of meters and tips. (Had that innovation arrived in, say, 1993, perhaps the 43 New York cabbies murdered that year would have lived.) But that doesn't mean you necessarily know who's in the car with you.

Frictionless has its appeal, at least until things start moving too fast.

—With reporting by KATY STEINMETZ/SAN FRANCISCO ◻

DALTON: GETTY IMAGES; CALIFORNIA: VENTURA COUNTY SHERIFF'S OFFICE

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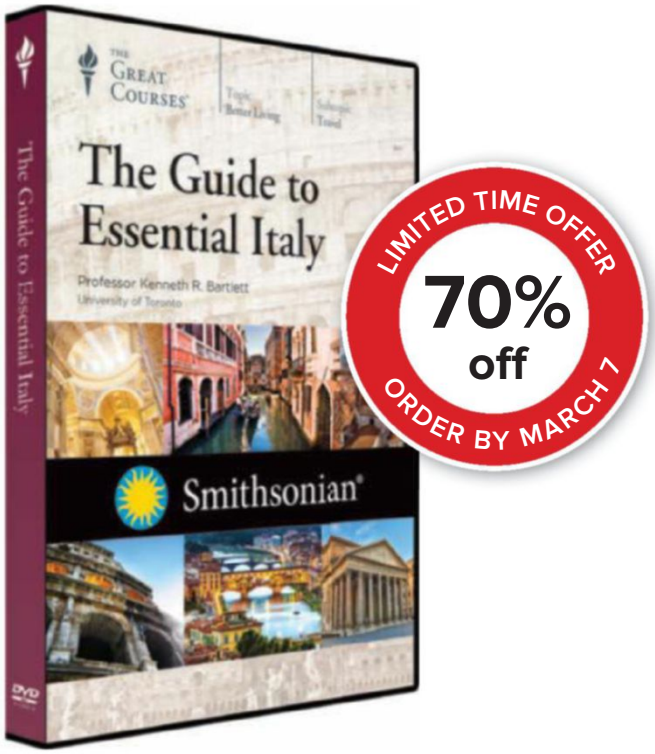

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IN THE ARENA

Donald Trump derangement syndrome and the lizard-brain campaign

By Joe Klein

IT WAS, OF COURSE, INEVITABLE THAT ON THE DAY AFTER Marco Rubio finished second in the South Carolina Republican primary, Donald Trump would eject a tweet questioning Rubio's citizenship. Rubio is a U.S. citizen. He was born here, the son of Spanish-speaking Cuban immigrants. (Trump's mother was a Gaelic-speaking Scottish immigrant.) But no matter. Rubio had just committed the ultimate offense in Trumpworld: he had shown not just a sign of life in the Republican campaign but also a sign of hope. In the waning days of the primary, he had appeared onstage with South Carolina's Indian-American governor, Nikki Haley, and its African-American U.S. Senator, Tim Scott. "Take a picture of this," Haley said, "because the new group of conservatives that's taking over America looks like a Benetton commercial."

The three did represent a new moment for the GOP, after the party's 50-year departure from its Lincolnian tradition of support for civil rights. Rubio has expressed sympathy with the Black Lives Matter activists: he had friends who'd been treated badly by police. Haley, famously, demanded the removal of the Confederate battle flag after the Charleston church shootings. Scott had grown up hard but pushed himself past the culture of dependency created by the liberal welfare state. Together, they posed the most effective reproach imaginable to Trump's white, nativist constituency—and also, more broadly, a general-election alternative to the Democrats, who are still playing ancient racial-identity and -victimization games.

So Trump tweeted, and Rubio responded succinctly: "This is a pattern, this is a game he plays. He says something that's edgy and outrageous, and then the media flocks and covers that and then no one else can get any coverage of anything else." Amen to that. South Carolina featured a daily spew. Trump accused George W. Bush of "lying" about Iraq's weapons of mass destruction. He threatened to sue Ted Cruz over a negative ad Cruz had run. And he'd embraced a tiff with the Pope—which the Pope started—about Trump's ridiculous border-wall proposal.

We in the media fixed on Trump's daily outrage, which meant that we didn't talk about two other important things: the substance of Trump's campaign, which is nonexistent, and the other Republican candidates. The United Colors of Benetton were shown but not discussed. And Jeb Bush, whose campaign provided more fresh ideas than all of his opponents combined, slipped away unlamented.

A FEW DAYS before the South Carolina primary, I appeared on *Morning Joe* and said Trump was operating out of his lizard brain—which is a common phrase for the ancient knob of reflexive lower-brain structures perched atop our spinal cord—rather than his frontal lobe, which is where thought and reason take place. For this, Joe Scarborough accused me of suffering from "Trump derangement syndrome."

The night before, Scarborough and Mika Brzezinski had hosted an hour-long town hall with Trump—and no other candidate. It was a classic Trump performance, filled with nastiness and ignorance. He said he would abolish Obamacare but would make sure people weren't "dying in the streets." (Of course, Medicaid takes care of the indigent poor; Obamacare covers those whose employers don't offer health care.) He said he opposed the trans-Pacific trade deal because of Asian currency manipulation. (But the Chinese, the prime manipulators, aren't part of the deal.) He said he would get Germany and South Korea to pay for the American troops protecting them. (They already do pay a share.)

Trump knows exactly what he's doing. His policy ignorance is a strategy. Every position he takes is carefully calibrated to elicit a reflexive response from his supporters. His campaign is about fears that have existed since before we became sapiens—fear of the other, fear of going hungry, the joy of martial triumph. He has been brilliant at picking those primal scabs. He has an uncanny ability to find the perfect brickbat to throw at his opponents: "low-energy" for Jeb Bush, "nasty" for Cruz, "not a feminist" for Hillary Clinton. He hasn't taken on Rubio yet, but I'm sure the attack will be precise and devastating.

His has also been the perfect campaign for television. He is outrageous, which is more fun than substance or sobriety. Outrage brings ratings, the one true currency in the desperately competitive world of broadcast news. This is another primal truth that Trump has figured out: the qualities that the Great American Audience now values most are the least presidential. □

TWITTER TROLL

Trump's tweets are designed to outrage and provoke

'I wonder if President Obama would have attended the funeral of Justice Scalia if it were held in a Mosque? Very sad that he did not go!'

'Ted Cruz lifts the Bible high into the air and then lies like a dog-over and over again!'

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Syria's Lost Cause

WESTERN-BACKED REBELS ARE IN DESPERATE STRAITS

By Jared Malsin/Kilis, Turkey

MAJOR MOHAMED ALI SADEK CAN'T feel his legs. A commander with the Levant Front, a mainstream rebel group in northern Syria, he is lying in a hospital bed in the Turkish town of Kilis, at least one bullet in his back courtesy of forces from a rival Kurdish-led armed group that attacked a checkpoint where he was stationed north of Aleppo on Feb. 4. Sadek is 38 but looks older, with dark gray hair, a deeply lined face and a bristling beard. A veteran of the Syrian army, he says he joined the rebellion because of outrage at the abuses of President Bashar Assad's regime. "We went out for food and for our rights, and because we were wronged in the dungeons of the intelligence services," he says. But now, in the wake of an immense Russian-backed offensive by the regime and other factions, Sadek says, "The Free Army in the northern countryside is about to be eliminated."

As it enters its sixth year, the rebellion against the Assad regime is in crisis. Backed by a Russian bombing campaign, Assad's troops and allied militias are advancing and have nearly encircled the rebels' most important redoubt in Aleppo, Syria's largest city before the war.

A Syrian from Idlib sits at a medical clinic in Turkey, where he is being treated for injuries from a Russian air strike

In the area surrounding Aleppo, the rebels are in a three-pronged fight with the regime, the forces of ISIS and now Kurdish militias that are using the cover of the Russian air offensive to expand their territory at the expense of the predominantly Arab Syrian rebels.

And if the rebels are losing the war, they may be losing the peace as well. On Feb. 22, the U.S. and Russia announced an agreement for a cease-fire between the regime, its allies and the opposition, but the pact was met with skepticism from observers who have seen past truces crumble. The proposed cease-fire, planned to go into effect on Feb. 27, doesn't include ISIS or al-Qaeda affiliates, which could undermine any agreement. It also excludes "other terrorist organizations designated by the U.N. Security Council," a phrase that analysts say leaves the door open to continued Russian bombing of opposition groups under the pretext of fighting terror. "They are all bandits and terrorists," Russian Prime Minister Dmitri Medvedev told TIME in an interview on Feb. 13.

Sadek still believes the mainstream opposition—rebels opposed to both the regime and the jihadists—can reverse the government's gains if they get help from the Western countries that share their goal of ending Assad's reign. "We can do it," he says. "We are the owners of the land. All of the fighters are there." But if that help doesn't come, Sadek believes, "the Islamists will take over."

IT MAY BE HARD to believe now, but it wasn't long ago that the Syrian rebels thought they were poised to win this war—or at least it seemed Assad could lose it. By 2012, the opposition had captured sections of major cities such as Aleppo and Homs, and the regime was in retreat. But Assad refused to go, and his forces resorted to widespread killing, placing entire cities under siege and dropping barrel bombs—crude containers packed with explosives that kill indiscriminately—on civilian areas. By mid-2015, the war had reached a bloody stalemate, with the country divided among the regime, dozens of rebel groups, ISIS and other jihadists, and Kurdish groups, all of which claimed slices of territory ceded by the regime.

That stalemate was broken by Russia's

Nineteen-year-old Syrian rebel Mamar Ubin wants to return to the fight

entry last September. Heavy Russian air strikes—most of them focused on Assad's rebel foes, not ISIS—helped the regime push back mainline opposition groups in the country's northwest and south. Shi'ite-dominated militias from Iraq, troops from Iran and fighters from the Lebanese group Hizballah all bolstered the offensive. In January and February, Russian air strikes helped proregime troops cut a vital supply line leading from the rebels' ally Turkey into Aleppo.

Of course, civilians have paid the heaviest price. Russia and the Syrian government have launched widespread attacks on hospitals, schools and other civilian infrastructure. On one day, Feb. 15, air strikes hit at least five hospitals and a school sheltering displaced people, according to the U.N., killing as many as 50. A U.N. assessment published Feb. 22 found that regime forces have deliberately targeted hospitals, and starkly concluded, "War crimes are rampant." "Today in Syria, the abnormal is now normal," Médecins Sans Frontières president Dr. Joanne Liu said in a statement after one MSF hospital in Syria was hit with four missiles, killing at least 25. "The unacceptable is accepted."

As the fighting worsened, some 70,000 Syrians fled their homes in the first 16 days of February. But they weren't able to flee Syria. At least 2.6 million Syrian refugees already live in Turkey, the largest refugee presence in any single country in the world, and in early February, Turkey moved to seal the border with Syria. Ankara says it favors the creation of a "safe zone" for refugees in northern Syria, but until that can happen, Turkey's new policy has essentially trapped tens of thousands in a war zone. "The people in those camps are really in a state of panic," says Priyanka Motaparthy, a researcher at Human Rights Watch. "It really is very much a disaster in the making. If people try to rush the border, if their panic reaches that level, that's very dangerous."

Some of the Syrians who have fled the recent escalation—and were allowed into Turkey for medical treatment—described relentless attacks on civilian targets resulting in the depopulation of entire towns. Assad Breir, 60, fled Tal Rifaat, which lies on the strategic highway between the Turkish border and Aleppo. Although they had no experience fighting, his two sons had gone to join the last-minute defense of the town against Kurdish militants, he says. The evacuation of the town was rushed and chaotic, and Breir seems to struggle to make sense of his memories as he tells his story. He managed to enter Turkey by joining a convoy carrying injured people from the town, including four of his relatives. Breir never saw his sons again. He was told they had been killed in the fighting. "In Tal Rifaat, everything was killed, down to the ants and the birds," he says.

THE BELEAGUERED SYRIAN REBELS are desperate to offset Russia's aid to the Syrian regime—and they believe the only way to do that is for allies in capitals like Washington and Riyadh to send them antiaircraft missiles and other game-changing weapons. But in its final year in office, the Obama Administration is unlikely to alter its policy, which is focused not on the Assad regime and its Russian backers but on combating ISIS. That limits its support to the rebel groups battling both Assad and ISIS. There's no guarantee more arms would prevent the rebels from losing. And with rebel groups fractured and constantly reorganizing, Washington is worried any heavy weapons could potentially fall into jihadist hands.

But the reality is that Vladimir Putin's move into Syria has already tied the U.S.'s hands. Even establishing a no-fly zone to protect rebels and civilians—a measure supported by the likes of Hillary Clinton and Turkey's President Recep Tayyip

IVOR PRICKETT—PANOS FOR TIME; REFUGEES: BULENT KILIC—AFP/GETTY IMAGES

Syrian refugees push one another as they wait for tents at the border between Syria and Turkey on Feb. 6

Erdogan—could bring the U.S. into conflict with Russia. "The only thing worse than getting sucked into a quagmire in Syria is getting sucked into a quagmire that leads to World War III," says a senior Administration official.

Quagmire may be unavoidable. The People's Protection Units (YPG), a Kurdish-led armed group in Syria, are taking advantage of the Russian bombing campaign and capturing rebel-held towns in northwest Syria. That places the YPG, one of the forces backed by the Pentagon in the fight with ISIS, into conflict with Syrian rebels armed by the CIA. It also infuriates Turkey, a NATO ally that backs the Syrian rebels but considers the YPG a terrorist group. In response, Turkey has begun launching artillery attacks on YPG positions north of Aleppo—positions so close that the din of exploding shells can be heard along the Turkish border.

With bombs exploding in its cities, its proxies losing ground in Syria and refugees massing on its borders, Turkey now faces a strategic impasse similar to the U.S.'s. Turkey has called for an international ground force to invade Syria—an unlikely scenario—and it could launch its own air strikes on Kurdish or ISIS positions. But any stepped-up intervention risks bringing Turkey into conflict with Russia. "That's a political choice the Turkish government is going to have to make," says Aaron Stein, a senior fellow at the Atlantic Council in Washington.

The Assad regime has strengthened its grip on part of Syria but still lacks a formula for a clear military victory. Its recent advances may only force the conflict into a new phase in which extremist groups like ISIS continue to gather strength, taking in fighters from battered rebel battalions. The rebels, though they've officially signed on to the peace deal, have little faith in diplomacy. "We are accustomed to a norm where from one international decision to another, the calamity increases," says Zakaria Malahefji, a spokesman for Fastaqim Kama Umirt, a rebel brigade in Aleppo.

Even if a cease-fire or peace deal could be reached, the regime's persistence means some rebels will keep fighting. "As long as the Assad circle controls the security establishment, the fighters can't really go home," says Robert Ford, a former U.S. ambassador to Syria. "They'll always have to worry about a knock on the door late at night, and no one will be able to protect them."

One of those fighters is Mamar Ubin. He is 19, and the war has dominated his life. An agricultural worker from a village in the northwest, he joined a rebel group roughly seven months ago and was soon deployed to the front lines facing regime forces in the hills near the city of Latakia. In early February, he suffered a head wound in a drone attack. His comrades took him to Turkey, where he is now recovering in a hospital in Reyhanli.

The strike left Ubin, already gaunt, with a patchwork of stitches across his forehead and over one ear. Yet he can barely sit still as he recounts tales from his months on the front lines. As soon as he recovers, Ubin plans to rejoin the fight. "I'll stay steadfast until I die," he says. "The war is going to be long. It won't end in one or two days." —*With reporting by* SIMON SHUSTER/MUNICH *and* MASSIMO CALABRESI *and* MARK THOMPSON/WASHINGTON

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ENCOUNTERS WITH THE ARCHGENIUS

A pioneer of artificial intelligence, David Gelernter has some radical ideas about the supremacy of the human mind

By David Von Drehle/Woodbridge, Conn.

ELECTIONS COME AND GO. MARKETS RISE AND FALL. CELEBRITIES wax and wane. But now and then we meet a controversy of deep and lasting dimensions. Some of our leading engineers and most brilliant theorists say the future of artificial intelligence is such a matter. Will machines learn to think like humans—and then to outthink us? And if they do, what will become of us?

The topic, once a staple of science fiction, has become one of the defining facts of high tech. From Apple to Amazon, Facebook to Intel, Sergey Brin to Elon Musk, the titans of the 21st century are investing fortunes and countless hours in artificial intelligence (AI). Google's 2014 purchase of the British firm Deep Mind for something more than $400 million produced a bonanza of publicity earlier this year, when its game-playing program whipped a human master of the ancient strategy game Go. IBM is pouring $1 billion into building a business around Watson, the company's digital *Jeopardy!* champion that chats with Bob Dylan in its latest ad campaign. Amazon's new personal digital assistant, Alexa, dwells in the cloud and, like her cousins Siri (Apple), Cortana (Microsoft) and Google Now, will dispense instructions from speakers, smartphones, televisions and cars. It's remarkable how quickly we've adjusted to their presence.

Among the thundering vanguard, though, is a growing group of worried individuals, some of them doomstruck Cassandras, some machine-hating Luddites and a few who fit in neither group. They take in the rapid rise of superintelligent machines—which are already taking over jobs as factory workers, stock traders, data processors, even

PHOTOGRAPH BY JEFF BROWN FOR TIME

news reporters—and conclude they will eventually render us all obsolete. "The development of full artificial intelligence could spell the end of the human race," warns Stephen Hawking, the renowned astrophysicist.

This is the topic that brings me through a snowy Connecticut forest to a house not far from Yale University. I am here to discuss the human mind and artificial intelligence with David Gelernter, artist, author, scientist, composer and stubbornly independent thinker. A conservative among mostly liberal Ivy League professors, a religious believer among the often disbelieving ranks of computer scientists, Gelernter is neither Cassandra nor Luddite. He is a computer virtuoso who happens to find human consciousness even more entrancing than the most amazing digital apparatus.

In his latest book, *The Tides of Mind: Uncovering the Spectrum of Consciousness,* Gelernter argues that the entire field of AI is off track, and dangerously so. A key question in the pursuit of intelligence has never been answered—indeed, it has never really been asked: Does it matter that your brain is part of your body?

Or put another way: What is the human mind without the human being?

This mind-body question has an odd place in the history of artificial intelligence. Alan Turing, one of the pioneers of the field, found it so daunting that he pushed it to one side. His seminal 1950 paper, "Computing Machinery and Intelligence," drew "a fairly sharp line between the physical and the intellectual capacities of a man," as he put it.

A similar attitude was struck a few years later by computer scientists at IBM. Reporting their breakthrough success in creating a computer capable of excelling at high school geometry, project leader Herbert Gelernter—David's father—declined to say "whether our machine is indeed behaving intelligently."

Over the half-century that followed, a funny thing happened on the dizzying road from electronic geometry whizbangs to the apocalyptic threat of Hawking's direst thoughts. AI theorists stopped treating the human body as an overwhelming problem to be set aside and started treating it as an irrelevant matter to be ignored. Today the mainstream argues that there is no meaningful difference between the human brain, with its networks of neurons and axons—electrical and chemical on-off switches—and computers powered by 1s and 0s. And by the same analogy, computer scientists understand the human mind to be the equivalent of software running on the brain-computer.

Whatever differences exist between humans and machines, today's gurus of artificial intelligence argue it will vanish in the not-too-distant future. Human minds, their memories and personalities, will be downloadable to computers. Human brains, meanwhile, will become almost infinitely upgradable, by installing faster hardware and the equivalent of better apps. The blending of human and machine, which Google's Ray Kurzweil calls the Singularity, may be less than 30 years off, they theorize.

David Gelernter isn't buying it. The question of the body must be faced, and understood, he maintains. "As it now exists, the field of AI doesn't have anything that speaks to emotions and the physical body, so they just refuse to talk about it," he says. "But the question is so obvious, a child can understand it. I can run an app on any device, but can I run someone else's mind on your brain? Obviously not."

In Gelernter's opinion, we already have a most singular form of intelligence available for study—the one that produced Bach and Shakespeare, Jane Austen and Gandhi—and we scarcely understand its workings. We're blundering ahead in ignorance when we talk about replacing it.

INSIDE THE HOUSE, evidence of the mind of Gelernter is everywhere. The towering walls of books—including his own works

FUTURE PROOFING

Prominent scientists, inventors, entrepreneurs and futurists expect competing things from the emergence of AI. What most divides them is whether the technology will be a benevolent development or a catastrophic one. Here's a look at that spectrum:

By Matt Peckham

AI WILL BENEFIT HUMANKIND

Gelernter falls here

Ray Kurzweil

INVENTOR, FUTURIST AND DIRECTOR OF ENGINEERING AT GOOGLE, 68

Kurzweil believes human-level AI will be achieved by 2029. Given the technology's potential to help find cures for diseases and clean up the environment, he says, we have "a moral imperative to realize this promise while controlling the peril."

Sam Altman

COMPUTER PROGRAMMER AND PRESIDENT OF STARTUP INCUBATOR Y COMBINATOR, 30

Altman, who's working on developing an open-source version of AI that would be available to all, believes future iterations could be designed to self-police, working toward benevolent ends only.

Michio Kaku

BEST-SELLING AUTHOR, THEORETICAL PHYSICIST AND FUTURIST, 69

Kaku takes a longer, more pragmatic view, calling AI an end-of-the-century problem. He adds that even then, if humanity has come up with no better methods to constrain rogue AI robots, it'll be a matter of putting "a chip in their brain to shut them off."

on computer science, religion, popular culture, history and psychology. His works of art—some abstract, some powerfully figurative, like the life-size evocations of the great kings of Israel inspired by Christian tomb art at the Basilica of St. Denis outside Paris. Musical instruments fill the floor space. Flamboyantly colored birds survey the scene—a purple parrot in a cage near the kitchen and a multihued macaw named Ike that presides over the family room. Gelernter's conversation runs in torrents from the prophesies of Isaiah to the subtleties of Gothic engineering to the proper design of graphical user interfaces.

Indeed, the breadth of his interests and the range of his thoughts can be overwhelming. Gelernter expresses sympathy for the graduate students in his new seminar on software design at Yale, which has been his academic home for most of his life. The students are flummoxed, he reports, by their professor's extensive discussion of medieval architecture, specifically the so-called strainer arches at Wells Cathedral in Somerset, England. Wrought from massive stone blocks and installed nearly 700 years ago to prevent the church from collapsing, these arches are as strong as steel—and as lovely as butterfly wings. His reason for dwelling on the subject, he explains, is that all truly great designs are beautiful as well as functional. "I try to tell them, if you're going to do anything good in software, it will be beautiful."

Sun Microsystems co-founder Bill Joy has called Gelernter, who pioneered breakthroughs in parallel processing, "one of the most brilliant and visionary computer scientists of our time." Gelernter's 1991 book, *Mirror Worlds,* foretold with uncanny accuracy the ways the Internet would reshape modern life, and his innovative software to arrange computer files by timeline, rather than folder, foreshadowed similar efforts by several major Silicon Valley firms. (A patent lawsuit against Apple was ultimately decided in Apple's favor.) Yet Gelernter is not enthralled by the power of computer science, which he considers to be essentially a secular religion for its devoted disciples. His colleagues in computer science are so enamored of their own miraculous designs, he says, that they refuse to consider the limits of their machines.

Go back to that Gothic cathedral for a moment. How does it work its effects on the people who enter? In its scale and design, its vast weight and fortifying inspiration, its dark vaults and diffuse lights, in the ancient stories signaled through episodes of glass and carving, the church speaks to the mind of the engineer as well as the emotions of the pilgrim. The building can be measured and analyzed. But it is also felt. And how it feels depends on the time of day, the mental state of the visitor, the depth of the silence or the rumble of the organ. It smells of incense and age. It soars, and it terrifies.

The human mind, Gelernter asserts, is not just a creation of thoughts and data; it is also a product of feelings. The mind emerges from a particular person's experience of sensations, images and ideas. The memories of these sensations are worked and reworked over a lifetime—through conscious thinking and also in dreams. "The mind," he says, "is in a particular body, and consciousness is the work of the whole body."

Engineers may build sophisticated robots, but they can't build human bodies. And because the body—not just the brain—is part of consciousness, the mind alters with the body's changes. A baby's mind is different from a teenager's, which is not the same as an elderly person's. Feelings are involved: a lifetime of pain and elation go into the formation of a human mind. Loves, losses and longings. Visions. Scent—which was, to Proust, "the last vestige of the past, the best of it, the part which, after all our tears seem to have dried, can make us weep again." Music, "heard so deeply/ That it is not heard at all, but you

AI WILL DOOM US ALL

Bill Gates

ENTREPRENEUR, PHILANTHROPIST AND MICROSOFT CO-FOUNDER, 60

The computer-software magnate turned philanthropist views near future low-intelligence AI as a positive labor-replacement tool but worries that the "super intelligent" systems coming a few decades down the road will become "strong enough to be a concern."

Stephen Hawking

THEORETICAL PHYSICIST, AUTHOR, PIONEER OF BLACK-HOLE PHYSICS, 74

The famed theorist believes AI could be both miraculous and catastrophic, calling it "the biggest event in human history" but also potentially "the last, unless we learn how to avoid the risks."

Nick Bostrom

DIRECTOR OF THE FUTURE OF HUMANITY INSTITUTE AT OXFORD UNIVERSITY, 42

Bostrom warns that AI could turn dark quickly and dispose of humans. The subsequent world would harbor "economic miracles and technological awesomeness, with nobody there to benefit," like "a Disneyland without children."

Elon Musk

ENTREPRENEUR, SPACEX FOUNDER, CEO OF TESLA MOTORS, 44

The outspoken engineer and inventor has famously called AI "our biggest existential threat," fretting that it may be tantamount to "summoning the demon."

GETTY IMAGES (7)

are the music/ While the music lasts," as T.S. Eliot wrote. These are all physical experiences, felt by the body.

Moreover, Gelernter observes, the mind operates in different ways through the course of each given day. It works one way if the body is on high alert, another on the edge of sleep. Then, as the body slumbers, the mind slips entirely free to wander dreamscapes that are barely remembered, much less understood.

All of these physical conditions go into the formation and operation of a human mind, Gelernter says, adding, "Until you understand this, you don't have a chance of building a fake mind." Or to put it more provocatively (as Gelernter is prone to do): "We can't have artificial intelligence until a computer can hallucinate."

Gelernter's new book is the fruit of a lifetime's reflection on such matters. Rejecting the analogy of brain to computer and mind to software as "childishly superficial," he describes a variable human consciousness that operates along a spectrum from "high-focus" to "low-focus"—up and down, back and forth, many times each day.

At high focus, the mind works exactly like a computer. It identifies specific problems and tasks. It calls on the memory for data and patterns and instructions necessary to answer the questions and perform the jobs at hand. High focus finds the mind thinking about thinking; that is, thinking on purpose.

At low focus, the mind may drift, even seem to go blank. Notions and daydreams pop up without being consciously summoned. At the lowest focus, when the body is asleep, the dreaming mind churns up images and memories and patches them together—not according to a rational blueprint, Gelernter argues, but according to some sensation or emotion that they share.

"As we move down-spectrum," he writes, "mental activity changes—from largely under control to *out* of control, from thinking on purpose to thought wandering off on its own. Up-spectrum, the mind pursues meaning by using logic. Moving down-spectrum, it tends to pursue meaning by inventing stories—as we try to do when we dream. A logical argument and a story are two ways of putting fragments in proper relationship and guessing where the whole sequence leads and how it gets there."

Inevitably to modern, logical readers, this description suggests a hierarchy. "Up-spectrum" sounds superior to "down-spectrum," "high-focus" better than "low-focus." We might ask—even if Gelernter is correct about the workings of the mind—why artificial intelligence should not operate solely at high focus and up-spectrum? Leaving the lower range of consciousness behind might be progress, right?

No, Gelernter contends. The full expression of the human mind requires the entire spectrum. His book, like his conversation, is a celebration of the full span. He quotes not only scientists and psychologists but also poets and novelists. A mathematical proof or scientific discovery is no greater sign of intelligence than is the "Ode to a Nightingale" by John Keats, who ends his masterpiece by wondering where on the spectrum of consciousness he was: "Was it a vision, or a waking dream?/ Fled is that music:—Do I wake or sleep?"

For that matter, not all logical breakthroughs come from minds operating at high focus. Consider the story of pioneering neuroscientist Otto Loewi. A century ago, Loewi tried to devise an experiment that could test his theory that the brain transmits some signals chemically. When he finally grasped the answer, it was at low focus, in a sequence of dreams. The experiment that Loewi envisioned while sleeping in 1921 eventually led him to a Nobel Prize.

DAVID GELERNTER WAS BORN in 1955 with a front-row seat on the computer age. On the dedication page of *Tides of Mind,* he hails his father as "one of the six men who invented AI." After earning his bachelor's degree at Yale, where he majored in religious studies and pursued an interest in neurobiology, Gelernter did his Ph.D. studies at Stony Brook University. (His father was a professor there.) He joined the computer-science faculty at Yale and pitched into the vital problem of parallel processing—in rough terms, how to make computers perform more than one task at a time.

SUCH MACHINES MIGHT BE MADE TO LOOK LIKE HUMANS, AND EVEN TO REACT LIKE HUMANS

His breakthrough in that field cemented his reputation for brilliance—and it came, he says, courtesy of a down-spectrum moment. After thinking at high focus about the problem of gridlocked signals, Gelernter daydreamed a vision of Grand Central Station so crowded that no one could move. The escalators were in motion, though, churning people from one level of the station to another. "To be conscious of a thought does not mean we know where it came from," Gelernter observes in *Tides.* Whatever its origin, the image freed Gelernter's mind to unstick the flow of signals in his software.

Later, Gelernter and a colleague attempted to program a computer to mimic low-focus consciousness. He imagined a sort of dial on the device that would move the machine up and down the spectrum, from Spock-like logic to loopy hallucination. Though the attempt did not achieve quite the results he had hoped for, the program did show a degree of suppleness that they eventually used to advance the role of computers in diagnosing diseases.

Gelernter has no doubts that huge strides can be made in expanding the spectrum of artificial intelligence. "Computers already have more than enough capacity to mimic low-focus thought," he says. With sufficient resources, a huge database can be compiled from human subjects connecting myriad images and sensations with matching emotions, he says, describing the work to be done. From there, machines equipped for "deep learning" could eventually become adept at faking the feelings that give structure to down-spectrum consciousness.

But his name for such machines conveys his concern and contempt: "zombies." They might be made to look like humans, and even to react like humans. But they would not have genuine human feelings. They wouldn't know the fear and exhilaration of riding a roller coaster, much less the racing heart and

JEFF BROWN FOR TIME

Gelernter in his Connecticut office, where he wrote his latest book, The Tides of Mind

flip-floppy stomach of young love, nor even the depressed exhaustion of grief.

Perhaps most important, the computer won't feel the existential dread or weird magnetism of death. Admittedly, this is exactly why the Singularity is so appealing to Kurzweil and his followers. By merging the human with the machine, the software mind is freed from its wet mortality and crosses to eternal life. But what is human consciousness without the shadow of death? "The meaning of life," wrote Franz Kafka, "is that it ends."

"Kurzweil," says Gelernter, "is a good man and very bright, very capable. It's just that some of what he says doesn't make sense. He's going to upload his mind to the cloud and live forever—what does that even mean? If my mind is running on another computer, it is no longer me."

ISSUES OF MORTALITY and limitations are not abstractions to Gelernter. His range of human feelings, including his familiarity with death, expanded horrifically one early summer day in 1993. In his office at Yale, Gelernter opened a package that had come in the mail. A pipe bomb, prepared by Ted Kaczynski—the so-called Unabomber—destroyed his right hand and left him fighting for his life. More than two decades later, Gelernter still deals daily with the pain and disability.

On some days, he feels estranged from a world that has little patience for "long-term consequences," he says. "It is hard for people to sustain their attention to chronic conditions and permanent injuries." He seems reluctant to say this, because he doesn't like complainers. He quickly adds, "In the final analysis, there is an insulating layer of kindness for which one thanks God."

Gelernter is not the only dissenter from the AI orthodoxy. Silicon Valley entrepreneur Roman Ormandy, for example, has criticized the brain-as-processor model. "The more neural research progresses, the clearer it becomes that brain is vastly more complex than we thought just a few decades ago," Ormandy has noted.

But Gelernter is vastly outnumbered—so much so that he worries that his ideas might simply be ignored. "There has never been more arrogance and smugness" than in today's self-congratulatory scientific culture, he asserts. "The spectrum of our consciousness is such a part of who we are and how we live in the world. But we make such a virtue of ignoring it. We have a fundamental cultural prejudice that high-focus thought is better, when if we would just examine our own lives we would see that we all hallucinate every day as we dream and see visions as we're falling asleep."

Computers are going to grow much more powerful, and they will be relied upon to complete far more tasks than they do today. Scientists won't stop in their pursuit of better programs on faster processors—nor should they. Gelernter fully appreciates that this progress will take machines deeper and deeper into the spaces previously reserved for human intelligence. Their memories will be bigger than ours and more rapidly accessible. Their importance will grow as they do more, tirelessly and cheaply. They will change the nature of work, of learning, of relationships.

This is precisely why we need to understand what computers are not, and can never be. For that, we must know ourselves. "We've turned away from exploring the human mind just when it was getting interesting," Gelernter says. But that's not entirely true. He hasn't. ◻

Revitalizing downtown takes the same ingenuity as moving a bass guitar across town.

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Tech

THE INCREASINGLY COMPELLING CASE FOR WHY YOU SHOULDN'T BE ALLOWED TO DRIVE

BY MATT VELLA/DETROIT

SMART CARS ARE ALREADY HERE

BY KATY STEINMETZ/SAN FRANCISCO

PHOTO-ILLUSTRATION BY BROBEL DESIGN FOR TIME

THREE THINGS TO KNOW ABOUT SELF-DRIVING CARS.

One: They're here. Last fall, Tesla Motors pushed a software update to its vehicles around the world. The new code coordinated sensors, cameras, GPS and controls already onboard the cars to allow for so-called autonomous driving—albeit with humans in the driver's seat ready to take over if needed. Within weeks, a crew of rally drivers climbed into a Model S in Los Angeles and sped to New York City in just over two days, the car steering itself 96% of the way. Other stoked nondrivers have posted videos of themselves reading books, brushing their teeth and otherwise ignoring the road as their cars zoomed along. Tesla founder Elon Musk predicts that his electric cars will be entirely self-driving (even docking themselves at robotic charging stations) within three years.

Mainline carmakers from General Motors to Mercedes-Benz have also pledged to sell autonomous vehicles in the next few years. Born-again evangelists of self-driving cars include some of the most venerable names in the business, such as William Clay Ford Jr., executive chairman of the company founded by his Model T–building great-grandfather Henry, and Toyota Motor Corp. president Akio Toyoda, whose great-grandfather was known as the "king of Japanese inventors." (Toyoda, a racing buff, was adamantly opposed to self-drivers before reversing himself late last year.) Four U.S. states have legalized self-driving cars, and at least 13 more are mulling similar laws.

Two: They're superior drivers. These words may grate in the sunburned left ears of car-loving Americans. But the computer is simply a better driver than a human. Better at keeping its eyes on other drivers; better at maintaining a steady cruising speed and thereby maximizing fuel efficiency; better at parsing GPS data, weather data, traffic data—any and all kinds of data, really—and better at making rapid-fire adjustments. The computer doesn't get distracted by a spouse, kids or the jerk who just made an illegal lane change. It doesn't sneak a glimpse at Snapchat, or fumble with a leaky burrito, or steer with its knees while playing air guitar. The computer couldn't blink even if it wanted to. It never says yes to a fourth chardonnay, never convinces itself that weed *improves* its driving. Asking directions is a computer's favorite activity, and unless ordered to, the computer never falls asleep.

Three: They're going to change everything. The economic and safety effects will be staggering; the moral and legal challenges will be stubborn. There is no "right to drive" enshrined in the U.S. Constitution, but forced to choose, a lot of people would rather take the wheel than the Fifth—no matter how many statistics are marshaled to prove that driving puts others' lives at risk. Self-driving cars will likely join digital surveillance and unmanned drones among the advances and controversies that mark our times. Freedom vs. security, that quintessential quandary of the 21st century, will frame the transition from human drivers to more-skillful computers.

And because the gulf between human and machine is so vast—and growing—the next step after making driverless cars legal will be making them mandatory. Today you pay higher insurance premiums to drive a zippy roadster than a dowdy minivan. Tomorrow you could well be paying a steep price for any steering wheel at all. Who will be liable for mistakes? How should computers make life-and-death decisions? Such questions are likely to contort ethicists and lawyers for years to come. But all revolutions involve upheaval, and this one is poised to create far more than it destroys.

FATAL TRUTHS

Cars have gotten safer but are not safe enough

28%
Increase in auto-related fatalities caused by distracted driving from 2005 to 2008

15–24
Age group for which auto-related accidents are the leading cause of death

32,675
Number of Americans who died in an auto accident in 2014

IN THE THRONE ROOM of the American psyche, a driver's seat occupies center stage. Think Bonnie and Clyde and their fugitive Ford V-8, Jack Kerouac on the road in a '49 Hudson, James Dean's fatal Porsche Spyder, Steve McQueen's Mustang fastback, Greased Lightning, the Love Bug, Thelma and Louise, Nicolas Cage vanishing in 60 seconds. What would the 1920s be without the Tin Lizzie, or the 1950s without the 'Vette, or the 1980s without the DeLorean? Nabokov could have been talking about a '55 T-bird or a '73 Eldorado—or whatever car you were driving the first time you mashed the gas and felt free—when he wrote, "It was love at first sight, at last sight, at ever and ever sight."

That connection between cars and drivers is nothing like the feeling we had for typewriters or landlines or any of a thousand technologies overthrown by computers and smartphones. That was utility; this is love. And yet America's long-standing romance with its cars has been deeply troubled, sapping time and treasure while leaving innumerable victims dead and maimed. A world without human drivers will be safer, more livable, more prosperous.

I admit to some bias here, since a human-driven vehicle nearly killed me.

Early on the morning of Oct. 16, 2014, I was run

PREVIOUS PAGES: HAND: GETTY IMAGES

down by a minivan driven by someone in a hurry to get somewhere. The driver ran a red light and knocked me over while I was jogging to work. In his defense, it was rainy and the intersection in question is a pain to cross. I woke up long enough in the ambulance to inquire about the status of certain precious organs below my belly button but lost consciousness again before I heard the EMT's reply. A few hours later, I walked out of the hospital more or less unscathed. Many people are not so lucky.

There are about 6 million car accidents—incidents serious enough to be reported to law enforcement—each year in the U.S. About 33,000 Americans die annually as a result, with an additional 2 million or so injured. (Worldwide, there are about 1.3 million traffic fatalities every year, according to the World Health Organization.) Some 94% of road accidents are the fault of drivers, according to the National Highway Traffic Safety Administration (NHTSA), whose collection of statistics reads like a numerical translation of Stephen King's *Christine,* a chilling account of motorized lethality. The price tag for this mayhem, by one estimate, runs $836 billion.

Other statistics tell of lesser forms of wastage. The average American spends 42 hours per year stuck in traffic—the equivalent of an additional week of vacation. In the country's most congested areas—Washington, D.C.; Los Angeles; and New York City—that figure climbs as high as 82 hours. Multiplied by the span of a working lifetime, this waste of a precious resource, time, is incalculable.

Even if you have been spared a serious accident and manage to live in a place where there is little traffic, your life is shaped for the worse by other drivers' flaws. Your car, for one, bears the stamp of human fallibility. Why does it look the way it does? Why is it so heavy? Why does it have more air bags than a Vegas strip club? Why are the bumpers shaped the way they are? The answer: engineering to keep occupants safe as well as legislation intended to keep people (like me) from being killed when struck.

To make a real leap forward in safety, the obvious move is to take drivers out of the equation. That is becoming today's reality with shocking speed. Just 12 years ago, when the U.S. government funded the first international competition for self-piloting vehicles, not one of the challengers finished the 150-mile (240 km) desert course set out for them. The most successful robocar covered a little more than 7 miles (11 km) before stupidly getting itself stuck. (Its wheels also caught fire.) The following year, only five of the 23 vehicles in the competition made it to the finish line, with the fastest one averaging a poky 19 m.p.h. (30 km/h). One of the finishers weighed 30,000 lb. (13,600 kg)—roughly 10 Toyota Priuses—and the rest were so larded with sensors, cameras, computer equipment and antennas that they made Mad Max's Interceptor look chill by comparison.

> Because the gulf between human and machine is so vast—and growing—the next step after making driverless cars legal will be making them mandatory

Today Google's autonomous test cars have logged more than 1.4 million miles (2.25 million km) on their odometers on public roads—equivalent to about 100 years of driving for the average individual. Total accidents: 17, all caused by human pilots. Ford's test fleet of self-driving cars—now charged with conquering wintry driving, one of the field's most vexing problems—will soon be the country's largest. And U.S. Transportation Secretary Anthony Foxx seized the occasion of January's North American International Auto Show in Detroit to announce a 10-year, $4 billion fund to promote self-driving research, along with a plan to dismantle regulatory barriers that might slow the development of autonomous vehicles. In February, NHTSA said computers controlling a vehicle should be legally defined as drivers rather than human occupants, validating those companies developing self-driving cars that have no steering wheel.

Even at this early stage in their development, self-driving cars promise huge gains in safety and efficiency. Driverless cars don't have to be perfect to change the world, argues Nidhi Kalra, an information scientist at the Rand Corp. They just have to be safer. "Relying on human drivers any longer than we must is too risky," she says.

According to a 2013 study by the nonprofit Eno Center for Transportation, converting just 10% of the U.S. vehicle fleet to self-driving cars would reduce the number of accidents each year by 211,000 and save 1,100 lives. In this modest scenario, the costs of human clumsiness would be cut by $25.5 billion. If, somewhere down the road, the share of self-driving vehicles rises to 90%, the number of accidents avoided could reach 4.2 million per year, with 21,700 lives saved. Self-driving technology is part of the reason that Volvo has pledged to have zero deaths or serious injuries in its new cars by 2020. In all, the adoption of driverless cars in the U.S. could save $1.3 trillion a year, according to a Morgan Stanley analysis—including $158 billion in fuel costs, productivity increases of $507 billion and $488 billion in accident-related savings. Total worldwide savings: $5.6 trillion.

IF YOU EVER TRIED to bump Dad to the backseat at a rest stop in Montana—no matter how many hours he'd been at the wheel—you have an inkling of the uphill fight that lies ahead for the driverless revolution. They can have our gearshifts when they pry them from our cold dead hands, many will cry. The coming years will no doubt be a seesaw of competing calculations, in which irrefutable data vies with ingrained passion.

Perhaps it helps to understand that autonomous cars don't just make human driving better. Ideally, they will remake driving in a wholly new way. Take intersection etiquette, for instance. To maintain the

peace and equality of the social contract, we place stop signs and traffic lights where roads meet. Traffic signs and signals force drivers to take turns. They suppress our inner 5-year-olds, even when the frustrations of driving push us toward a tantrum.

Fully autonomous vehicles have far less need for this wasteful stop-and-start regime. They will be capable of communicating with one another and regulating their speeds to stagger their arrivals at crossroads. They will arrange seamless mergers on and off freeways. Traffic management will become a sort of precision ballet in a fully autonomous world.

Parking, too, will be transformed. Estimates vary, but for every car in the U.S. there are between two and three parking spaces—one at home, one at work and fractions at the mall, airport and stadium. Together, these amount to about 500 million spaces in all, or a total area of more than 3,000 sq. mi. (7,770 sq km), some 2 million acres (810,000 hectares). Wildly inefficient. A University of California, Los Angeles, study found that 30% of drivers in certain metropolitan business districts are basically driving in circles at any given moment, searching for an open spot. Meanwhile, there may be hundreds, even thousands, of unoccupied spaces in lots on the edge of town.

Automated cars are like tireless parking valets (except that you don't have to tip them). They can drop passengers off at their destination, pick up a signal from an empty parking space and then zip away for the return trip. When riders are ready to be picked up, a tap on a smartphone will hail their cars. Already, Tesla software includes a function called Summon, which fetches the vehicle from nearby parking. Within two years, the firm claims, Summon will be able to retrieve cars from almost any distance.

This feature and others will gradually remake the landscape. Restaurants, big-box stores and offices will no longer be surrounded by asphalt tundra. And "if you have cars that do not crash, you can eventually begin to redesign roads," says Erik Coelingh, who leads Volvo's self-driving-car initiative. "Lanes are 3.5 meters wide. Why? Because people can't drive straight. They need some lateral margin. Bridges, overpasses, underpasses—all could be built much more cheaply" when vehicle movement can be dictated by efficient algorithms.

Subtract human drivers and efficiencies multiply. Steven Shladover, a University of California, Berkeley, engineer, has calculated that even on a freeway at peak capacity, only about 5% of the roadway surface is occupied by cars at any given moment. With computers in control and communicating from car to car, density could safely double, even triple, while the same average speed is maintained. Squeezing more vehicles onto existing roads would relieve pressure to widen highways, let alone build new ones.

> The cycle could feed on itself until driver's licenses are a rare credential, like Latin professorships or tugboat captaincies

There are less tangible effects as well. Autonomous vehicles offer improved mobility for the young, the elderly and the handicapped. According to the U.S. Census Bureau, 88 million Americans will be over 65 by 2050—and nearly 18 million of them over 85. Anguished family conversations over whether to confiscate a parent's car keys would become a forgotten bit of history.

But every Eden has its serpent, the driverless autopia included. At conferences to discuss this future, contrarians often raise a version of the classic "trolley problem." What will happen, they muse, when an algorithmic car must choose between a swerve that would doom a dozen bystanders and a crash that would kill the vehicle's lone occupant? Or an easier dilemma: At what age will passengers be allowed to ride alone in an autonomous car: 18? 12? 6? Startup chauffeur services already offer rides for children as young as 7. UberFamily allows parents to order up vehicles equipped with car seats and tablets (though it discourages kids younger than 18 from riding unaccompanied). These and plenty of other objections will provide ammunition as America's libertarian id struggles to hold on to the keys.

Not to mention this: the revolution will destroy a lot. The $198 billion auto-insurance industry, the $100 billion parking industry and the $300 billion auto-aftermarket business (including everything from engine parts to mirror dice) are just a few of the industries in line for deep disruption. A survey last summer by the consulting giant KPMG estimated that the auto-insurance industry could shrink to less than 40% its current size over the next 25 years, just because of smarter cars. People will lose jobs. There are about 3 million truck drivers in the U.S., 200,000 cabbies, 170,000 auto-body and glass-repair technicians.

Many in the car business worry that self-driving vehicles are just one tragedy away from the scrap heap—like, say, a robotic car killing a child or running its occupants off a cliff. (Faulty and dangerous technology has doomed certain car models and delayed entire companies, sometimes for decades.) And hacking is a real concern that has yet to be fully grappled with.

HOW FAR OFF is this great reckoning? Estimates vary—but not by much. Tesla founder Musk has pegged the driverless-car transition to begin around 2023, a date closer to us than 9/11. "You can't have a person driving a 2-ton death machine," Musk said at a conference last year. "It's too dangerous." Ray Kurzweil, another big Silicon Valley brain, who helps run Google's engineering efforts, agrees with Musk: Prevalence in the next decade. Industry analysts roughly think 2035 to 2050.

What's certain is that like all technological revolutions, this one will have a self-compounding effect:

more and more driverless cars on the road will result in more and more machine-centric street designs. These will in turn make it harder for humans to share the road, which will force more drivers to trade in their wheels. Because computer-controlled cars don't get tickets, cash-starved municipalities may encourage their highway patrols to let a lot fewer human drivers off with a friendly warning. One way or another, you will be taxed for driving the old-fashioned way. The cycle could feed on itself until driver's licenses are a rare credential, like Latin professorships or tugboat captaincies.

For the time being, autonomous cars will include a backup role for human drivers. Indeed, during the cross-country test of the self-driving Tesla, the car—assured of its own handling skills—had a disquieting tendency to race into curves at breakneck speed. The steering wheel will probably stay—for a while, says Google co-founder Sergey Brin. In general, however, Brin and other executives in the self-driving arena continually stress that humans are the most dangerous link in the transportation chain. "I think for a large percentage of our day-to-day driving we're going to much prefer for the car to drive itself," Brin told the *Wall Street Journal* in September. "It'll be safer for both the occupant and the people around you." Manufacturers like Volvo and Mercedes-Benz have ratified that position by promising to assume the liability for any mistakes their smart vehicles make.

I find it strange, in a way, to be so eager for this future. I started my career covering the auto business, and as a kid I delighted in identifying makes and models from small details like the shape of a headlamp or a rear quarter panel. I have gotten misty in the stands of the Indy 500 and on the catwalks above Ford's F-150 truck plant in Dearborn, Mich. I hold road memories dear—especially the long hours in the passenger seat of my dad's convertible on cross-country trips devised to help me "understand America."

That understanding is impossible without an appreciation for our car culture. In the 20th century—the American century and the car century, no coincidence—the U.S. grew "strong, ample, fair, enduring, capable, rich," as Whitman rightly projected, with the auto industry in the driver's seat. The near death of Big Auto, first in the 1970s and later in the wake of the 2008 financial crisis, hit us in a way that the demise of, say, passenger trains never did. We went to the moon, and what did we do when we got there? Took a joyride in a rover that resembled a deuce coupe without a shell.

But the romance is cooling, and not just for me. Rates of motor-vehicle licensure are plummeting among millennials. Younger Americans are flocking to cities, where life is cheaper and easier without a car. The obligations and costs of transportation—accounting for about 17% of household budgets—are pushing many out of car ownership altogether. Scanning the horizon, Ford's namesake chairman refers to the firm's future as a "mobility" company, not just a carmaker. "Cars have become more appliance-like," says Jay Leno, the country's most famous car collector and host of *Jay Leno's Garage* on CNBC. "Kids don't really bond with cars anymore. Every kid I knew was at their DMV as soon as they turned 16. Now I meet kids, and it doesn't quite hold the same interest. I think the love affair is not over, but I think it's safe to say it's waning."

Mom and Dad are headed in the same direction. Nearly 60% of U.S. adults surveyed by the University of Michigan said they felt positively about autonomous vehicles; a little more than 15% said they were ready to give up driving altogether.

Drivers have already lost more control of their cars than you might imagine. Stability control, automatic braking, all-wheel drive, steering by wire, traction control, lane control, automated cruise control—these and other features add up to the skeleton and nerves of an autonomous car. The last truly analog car, whose built-in technology didn't far surpass any normal driver's natural ability, was likely manufactured three decades ago.

Freeing carmakers and designers of their chief constriction—unreliable drivers—will allow them to dream up novel creations. Consider the prototype car that Google recently unveiled. While the little two-door has all the sex appeal of a jelly bean—it looks like an old iMac on wheels—it is different enough from your average sedan to suggest the power of the new. Google's prototype has no steering wheel and no pedals. (With talks reportedly under way between Google and Ford, some version of the car could be in production by 2020.) Mercedes-Benz's recent F 015 concept car has seats that rotate 180 degrees to face each other; inside, it looks vaguely like a high-end spa. And if Apple gets into the car business, as many now expect, the iCar will surely think, and look, different.

Cars, like architecture or literature, change to reflect the times. In the jet age, they sported chrome and tail fins. SUVs mushroomed in the go-go 1990s. Hybrid crossovers reflect today's desire to have our cake and eat it too. The self-driving car will be a mirror for tomorrow. You can already glimpse the outline in Silicon Valley, where children watch for Google's test vehicles and throw both hands in the air when one passes. "Look, no driver!" the gesture says.

So I come not to bury car culture, but to praise it—not just its past, but its future. Safer, smarter, faster, more comfortable. Why not? Where the craftsmanship of our industry meets the creativity of our algorithms, there we'll find a new version of Kerouac's "purity of the road." That's what calls America forward now.

1930s
Norman Bel Geddes' vision

2005
DARPA self-driving car

THE LONG ROAD

Self-driving cars—extolled at the 1939 World's Fair—have come a long way since the government's first sponsored tests 12 years ago. Tesla's models were recently updated to add a raft of autonomous features. Concepts from Google and Mercedes-Benz paint a picture of the near future.

2015
Tesla Model S

2015
Google prototype

2015
Mercedes-Benz F 015 concept

FROM TOP: COURTESY EDITH LUTYENS AND NORMAN BEL GEDDES FOUNDATION—HARRY RANSOM CENTER/UNIVERSITY OF TEXAS AT AUSTIN; GETTY IMAGES; TESLA MOTORS; GOOGLE; MERCEDES-BENZ

FORGET THE DISTANT FUTURE, SMARTER CARS ARE ALREADY HERE

BY KATY STEINMETZ

WHEN THEJO KOTE TURNS on his Audi A4 near his apartment in San Francisco, his home starts to cool down because the car has told his thermostat that he's heading out for the day and it's time to start conserving energy. His company, Automatic, makes a little dongle that plugs into a slot beneath the steering wheel of most cars on American roads (probably including yours) to enable this kind of cross talk. As Kote drives around to showcase the gizmo's other talents—like sending his smartphone information about his fuel-wasting jackrabbit accelerations—he points out the little gestures exchanged between humans in cars and on foot. These nods and knowing glances that make it clear who should go and who should wait are still beyond the reach of algorithms, he says: "We've come maybe 85% of the way. But that last 15% is very, very hard. Because cars and computers in general aren't very good at things that humans take for granted."

There is no denying that self-driving cars are coming, but people like Kote believe the death of the steering wheel is further off than futurist CEOs might suggest. The legal, ethical and technical challenges may keep that reality out of most people's driveways for decades. Which means that for now, focusing on a truly driver-free future is like imagining the last scene of a play already in the throes of Act II.

Cars are well into the biggest automotive revolution since Henry Ford debuted his assembly line. This historic transition from analog to digital promises to do to driving what the iPod and streaming did to music. Cars are fast becoming nodes in a network that could make driving more fun, more convenient, more safe—and in some ways more complicated—than ever. As General Motors CEO Mary Barra put it last year, "The industry will experience more change in the next five years than it has in the last 50."

Imagine a car that knows where you want to go before you even touch the GPS. Imagine a car that can sense that another vehicle is about to T-bone it and shifts the driver's seat away from the impact before it happens. Imagine a car that's its own wi-fi hot spot. Imagine cars that, because they are digitized, can be remotely hacked and the steering and the brakes taken over. All of that—and more—is already here.

UPGRADING THE UPGRADES

AT GOOGLE'S I/O developer conference last May, early adopters clamored to try the company's take on cardboard virtual-reality machines. Nearby, lines of people waited to get into upcoming versions of vehicles like the Audi Q7 ($54,800), Hyundai Sonata ($21,750) and Chevy Spark ($12,660), all parked on an elaborate carpet designed to look like a freeway. Side by side, automakers and Google were demonstrating the fruits of their partnership: cars equipped to run Android Auto, new technology that essentially turns a car's infotainment system into a giant smartphone, with purposeful limitations.

With an Android smartphone plugged in, Android Auto enables your car to read texts to you as well as send replies dictated to it by voice. It can give you constantly optimized, step-by-step directions, without requiring you to check the phone lying in your lap or on the passenger seat. And it can give you helpful suggestions courtesy of a system that, as Google product manager James Smith says, is designed to turn your car into a "new personal assistant." If you've just been Googling a restaurant, for instance, Android Auto will suggest that eatery as a logical destination when you slip into the driver's seat. Apple's competing system, CarPlay, offers many similar features for iPhone users.

The best part: users will be able to get new features without getting a new car, since these software systems are designed to take upgrades. This means that rather than having their tech frozen in time once they drive off the lot, owners of a 2016 Honda Accord could potentially get the same experience as the driver of a 2018 Porsche 911. At the 2016 North American International Auto Show, CarPlay and Android Auto were two of the most discussed improvements rolling out to new vehicles this year.

What you can't do using these systems is anything that might amount to distracted driving, the companies say. For now, that means no video streaming and no *Angry Birds*. And every available app must adhere to strict protocols. "We take a pretty conservative view of what should go on there," says Google's Dylan Thomas, "because we're under a lot of scrutiny." The National Highway Traffic Safety Administration (NHTSA) has guidelines about everything from how many seconds drivers' eyes should be taken off the road to how big display text on in-car screens should be.

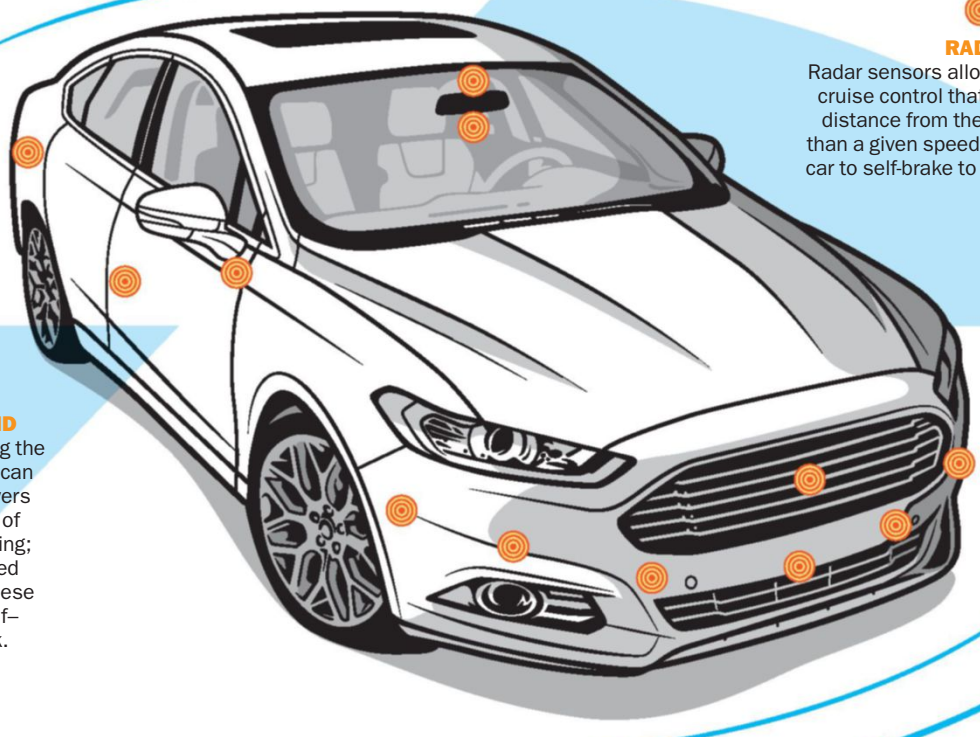
Google and Apple argue that their technology will actually make driving safer. If the alternative to using these systems is old-fashioned texting while driving—something that 61% of drivers with smartphones admit they do despite finger-wagging PSAs—then, the logic goes, using voice-enabled apps has to be a step in a safer direction. While tech firms are being more cautious than usual, car manufacturers are cautiously moving faster. In some ways, "we absolutely need to move as quickly as the technology companies,"

HOW NEW CARS SEE THE WORLD

New models—high end and budget alike—are covered in dozens of sensors that make them aware of their surroundings. Manufacturers want to increase safety and convenience as much as they can, while humans are still legally (and literally) in control.

V2V
By beaming out basic data about their location and heading to nearby vehicles, cars will be able to send and receive warnings about dangers that drivers can't see.

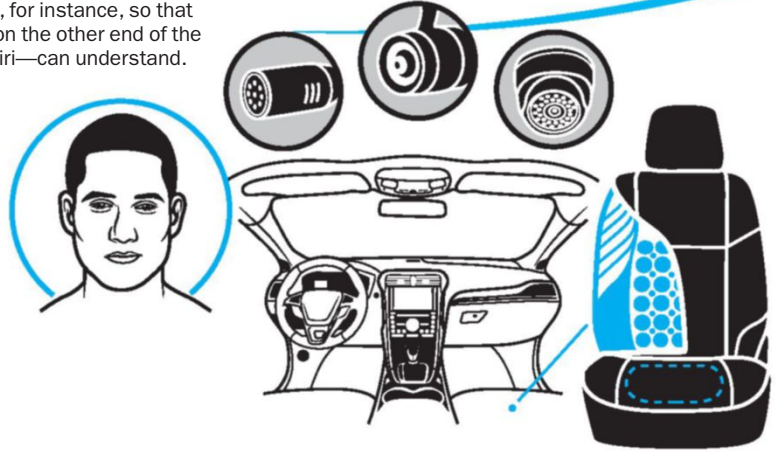
RADAR
Radar sensors allow cars to be set on cruise control that maintains a safe distance from the car ahead rather than a given speed. They can alert the car to self-brake to mitigate collisions.



ULTRASOUND
Sensors covering the front and back can signal that drivers are in danger of hitting something; more-advanced vehicles use these signals to self–parallel park.

CAMERAS
Exterior cameras read lane markings so cars can self-steer to keep from drifting. Combining wide-angle shots provides an overhead view helpful for tight parking.

MICROPHONES
Microphones are tuned for voice commands, working to cancel road noise, for instance, so that somebody on the other end of the line—or Siri—can understand.



FACE CAMERA
Cameras pointed at the driver are being designed to monitor eye patterns to detect distractedness when a car is self-steering or sleepiness when a human has hands on the wheel.

SENSORY SEAT
Haptic seats alert drivers to dangers like a vehicle in their blind spot via vibrations under the left or right thigh. Other sensors detect whether the seat is occupied to activate air bags in a crash.

ILLUSTRATION BY TODD DETWILER FOR TIME

says Ford's connected-vehicle expert Don Butler. "At the same time, when more than 3,000 different parts and subsystems come together to make a vehicle, there's a huge amount of rigor that is necessary."

Everyone must tread carefully when their actions could cause a vehicle, not just a phone, to crash. "The level of safety, security and maintenance of cars is orders of magnitude more than PCs," says designer Gadi Amit, whose Bay Area firm, NewDealDesign, has worked on several projects that involve car technology. "What the tech world is used to calling an update is called a recall in the automotive world."

SENSORS ON WHEELS

IN SOME WAYS, cars have been "smart" for decades. In the 1970s, automakers started turning to electronics for better engine control. Then came other computerized features like antilock brakes and power steering. New cars are now covered in sensors and cameras that aid drivers in their decision-making, while the insides are filled with data-spewing operating systems. Though most drivers are oblivious to it, things like location, speed, wiper status, fuel level, passenger presence, traction, battery status and acceleration, for a start, are digitally tracked. A modern car has more code than a Boeing 787.

Now that these powerful computers are coming online, this data can tell analysts about everything from potholes that need filling to where a new road needs to be built. Andrew Poliak, who works for QNX, a tech company that is to connected cars what Microsoft is to PCs, says he wrote to President Obama when GM declared bankruptcy, arguing that the government could actually save money if it only leveraged the data America's biggest automaker had collected through its OnStar system. "We spend so much money as a nation on traffic information," says Poliak. "The amount of data that a connected car can generate—this giant sensor on wheels—could eliminate a lot of that excess spending."

Auto manufacturers say they're analyzing feedback to build better cars and predict problems before they occur. As more cars become connected, recalls could be downgraded to something more like a software update. Fiat-Chrysler, for instance, addressed a recent recall of 1.4 million cars by shipping owners USB drives. Tesla has sent Model S owners over-the-air updates that change how the cars actually handle.

On an individual level, data may make a dent in the typical $9,000 spent each year on maintaining a car by flagging problems like a battery that is about to go bad. The inscrutable and easily ignored CHECK ENGINE light will fast be made obsolete by cars that can self-diagnose and offer to set up an appointment at the local dealership before anyone gets stranded. Standard features that allow people to use cellular signals to locate, precool and remotely check in on the health of their vehicles are also becoming more common. "What we can do," says Phil Abram, an executive director at GM, "is make sure you're more empowered because you know where your car is, you know what the status of your car is. You're in control of that."

Companies are also rolling out driver-behavior tools that use beeps or reports to teach people how to drive more efficiently; some insurers use them to give good drivers discounts. (This also offers parents a new way to coach their teens.) And connected vehicles can talk to other devices like garage doors and security systems on the so-called Internet of Things. "Your home [should be] revolving and adapting to the coming and going of the family," says Mike Soucie, who heads partnerships at Alphabet's smart-home company, Nest. "Part of that coming and going is obviously through the car."

MORE DATA, MORE FEES

PARKS ASSOCIATES, a firm specializing in connected industries, estimates that mobile networks such as AT&T and Verizon will be making nearly $1 billion each year in connected-car revenue by 2018. If someone wants to, say, wi-fi-enable a car for an eight-hour family road trip, a day of connectivity via AT&T could cost $5 to $50, depending on the user's plan and how much data the kids in the backseat can pull down.

The connectivity of cars is potentially a gold mine for marketers too. When Hewlett-Packard partnered with Ford to track company cars in an experiment, fleet managers found out when vehicles were over- or underused. They got an overview of things like how often sales reps' cars sat idle in

GOING THE EXTRA MILE

Today's in-car computers are able to evolve over time. Here's a closer look:

ANDROID AUTO
Drawing from your recent Google searches, Android Auto will suggest likely destinations when you get behind the wheel.

APPLE CARPLAY
Apple's digital assistant, Siri, integrates with cars' built-in microphones to make phone calls and send texts via voice commands so hands stay at 10 and 2.

AUDI MMI
Audi's system can use a snapshot of anything—say, a plate of food a friend sent—to navigate to the location where it was taken (assuming it's tagged with GPS coordinates).

FORD SYNC
Ford's AppLink allows drivers to use smartphone apps like Pandora through a car's system; Toyota announced in January that it will adopt a version of the same platform.

MERCEDES COMAND
A new Mercedes E-Class will have touch-sensitive controls on the steering wheel that respond to swipes much as a smartphone screen does.

ILLUSTRATION BY MARTIN GEE FOR TIME

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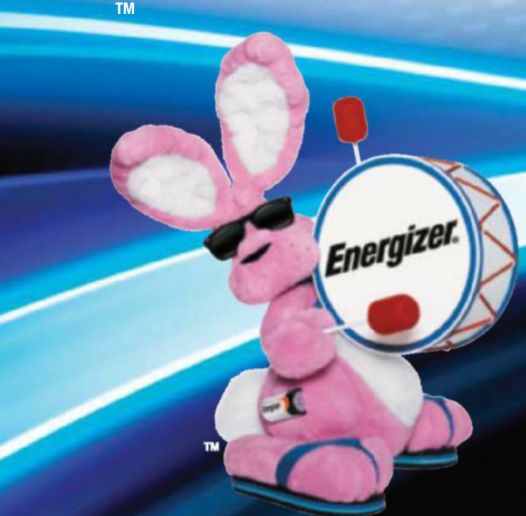

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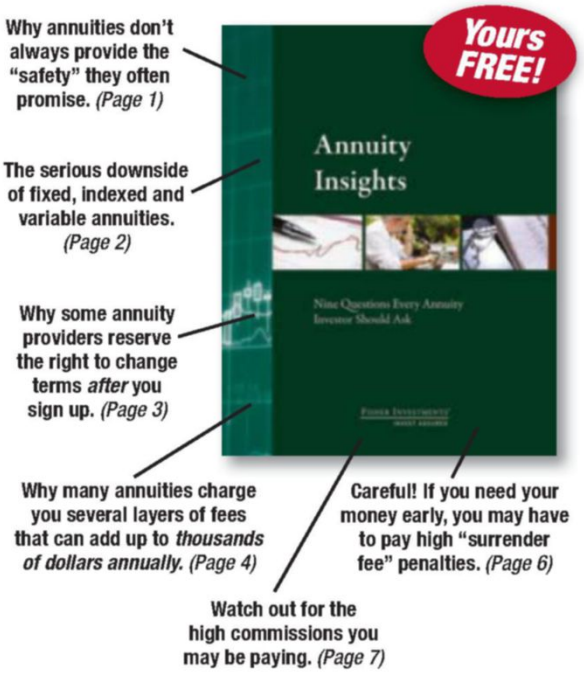
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Why some annuity providers reserve the right to change terms after you sign up. (Page 3)
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airport parking lots (16% of the time) when they could have been lent to another employee. But with access to GPS, the company was able to learn much more—including where employees most often purchased gas (Shell) and which on-the-go eateries were their favorites (McDonald's, Starbucks, Burger King). This information could lead to partnerships in which marketers push coupons to customers driving near certain locations. Internet-radio apps have tested ads for eateries "two exits up."

"It does get a little tricky about what is and isn't privacy data," says Zac Doerzaph of the Virginia Tech Transportation Institute. "Most people in similar spaces are willing to give up a little bit of privacy if they get some benefit in return, so I suspect this will end up the same way." Automakers are careful to emphasize that data belongs to the drivers.

TALKING CARS

NEAR BLACKSBURG, VA., there's a 2.2-mile (3.5 km) stretch of asphalt known as the Smart Road. This is a place where auto manufacturers and governments can test high-tech features that might not be ready for the open highway. Doerzaph and his colleagues at Virginia Tech recruit local volunteers and put them behind the wheel, seeing how they react, for instance, when a car is steering itself and a robotic pedestrian pops into its path. Many of the features being tested are the newest takes on "driver assist" technology. Cars can now steer and stop and go (under certain circumstances) for the driver. Cameras in the car can detect patterns that suggest a driver is sleepy and sound an alarm. The Smart Road is also a laboratory for technology that is not yet widely deployed in any form and could be far more revolutionary. The cars and infrastructure there, like traffic lights, are equipped with short-range radios that allow them to exchange information. By sharing tidbits like their speed and heading, cars can communicate around blind curves and drivers can get warnings when two vehicles appear to be on a crash course.

NHTSA believes that this technology—known as vehicle-to-vehicle communication, or V2V—stands to avoid or mitigate up to 80% of crashes among unimpaired drivers, even with error-prone humans involved. The agency will likely issue a rule that requires some form of V2V on new cars in the next several years. "What we're doing is mandating the communication protocol for vehicles to understand each other, so they're speaking the same language," says Nat Beuse, NHTSA's associate administrator of vehicle-safety research. GM became the first manufacturer to announce that it would deploy V2V on a retail model, the 2017 Cadillac CTS. If those cars get close to one another, they will be able to exchange warnings about dangers like slippery roads up ahead.

DOWNSIDES

NOW, THE BAD NEWS. Hackers have already made it clear that making cars out of computers exposes new vulnerabilities. Last year, two of them teamed up with a reporter from *Wired* to hack a Jeep Cherokee, taking over the steering and braking as the journalist gave in to panic. (Hence Fiat-Chrysler's recall by USB drive.) Other researchers worked their way into the operating system of Tesla's Model S. They were able to make the speedometer disappear, control the doors and even shut it off. (The company quickly fixed the bug with an over-the-air update.)

NHTSA is working on security protocols, trying to figure out how vehicles can be sure they're getting and sending trusted messages. Still, experts say there are legitimate concerns about terrorism or even activism, if hackers decide to bring a six-lane highway full of cars to a sudden halt. To avoid any unsavory scenarios, the car industry will need to work together. While a slew of manufacturers have created their own cybersecurity posts in recent years, they are also teaming up to create a security consortium that will share information about threats without sharing trade secrets, much as the finance industry does.

The industry is also coming up with privacy guidelines, which will be a touchy subject as cars get more connected. NHTSA seems to know that no matter how many times it reiterates that data won't be stored or attached to a person after it's beamed out via V2V, people will continue to be nervous about Big Brother's having more information on their whereabouts. In a survey, Parks Associates asked vehicle owners about concerns they would have if their car were connected to the Internet. The second most popular answer, at 55%, was that drivers would be concerned about the security of their location data. It was beaten only by fears that there would be hidden costs associated with the connectivity.

"Your computer or your phone has vulnerabilities," says John Capp, GM's V2V expert. "There will probably always be a threat to electronic systems. It's just part of the world we live in." Parks Associates estimated that a quarter of cars on U.S. roads last year had some connectivity capability, the simplest form being a way to leverage the driver's smartphone connection.

ENDLESS ROADS

THERE IS A GROWING PILE of promises about autonomous vehicles coming from companies ranging from Uber to Ford to Google. But all the little improvements that are going live in the meantime might add up to a point at which we've found our driving lives revolutionized before we even get to the last act. David Cummins, a Xerox executive who heads the company's smart-parking and mobility initiatives, believes the present is already outdoing those breathless predictions for the future. "Cars parallel park themselves now. Cars speed up and slow down on their own already. Cars have all kinds of accident-avoidance technology. And you are going to have more and more and more of that introduced over the next three to five years," Cummins says. "By the time that first car rolls off the factory line without a steering wheel, it's not going to be that much of a shock. The collective response may be more of a shrug. As in, 'It's about time.'"

Why We Cry

Science is close to solving the mystery of why humans shed tears (and why some don't)

By Mandy Oaklander

MICHAEL TRIMBLE, A BEHAVIORAL neurologist with the unusual distinction of being one of the world's leading experts on crying, was about to be interviewed on a BBC radio show when an assistant asked him a strange question: How come some people don't cry at all?

The staffer went on to explain that a colleague of hers insisted he never cries. She'd even taken him to see *Les Misérables,* certain it would jerk a tear or two, but his eyes stayed dry. Trimble was stumped. He and the handful of other scientists who study human crying tend to focus their research on wet eyes, not dry ones, so before the broadcast began, he set up an email address—nocrying10@gmail.com—and on the air asked listeners who never cry to contact him. Within a few hours, Trimble had received hundreds of messages.

"We don't know anything about people who don't cry," Trimble says now. In fact, there's also a lot scientists don't know—or can't agree on—about people who *do* cry. Charles Darwin once declared emotional tears "purposeless," and nearly 150 years later, emotional crying remains one of the human body's more confounding mysteries. Though some other species shed tears reflexively as a result of pain or irritation, humans are the only creatures whose tears can be triggered by their feelings. In babies, tears have the obvious and crucial role of soliciting attention and care from adults. But what about in grownups? That's less clear. It's obvious that strong emotions trigger them, but why?

There's a surprising dearth of hard facts about so fundamental a part of the human experience. Scientific doubt that crying has any real benefit beyond the physiological—tears lubricate the eyes—has persisted for centuries. Beyond that, researchers have generally focused their

TEARY TICS

For hundreds of years, scientists have been trying to understand the evolutionary and biological purpose of human tears. These illustrations, based on the work of grief researcher and psychologist Hans Znoj, depict the 12 facial contortions commonly made by people when they cry.

ILLUSTRATION BY BROWN BIRD DESIGN FOR TIME

Figure 1

Forcing your eyes shut

Figure 2

Touching your eyes

Figure 3

Wiping

Figure 4

Pressing your lips

Figure 5

Swallowing

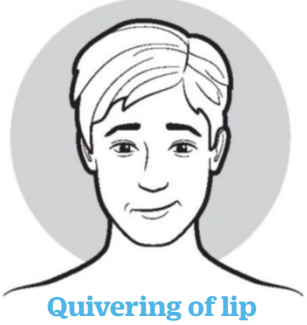
Figure 6

Blowing your nose

Figure 7

Self-soothing touches

Figure 8

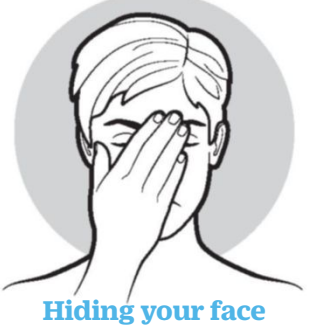


Quivering of lip

Figure 9

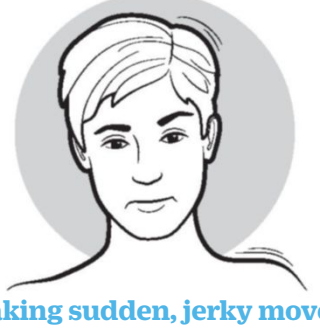
Sighing

Figure 10



Hiding your face

Figure 11



Making sudden, jerky moves

Figure 12

Gazing up

attention more on emotions than on physiological processes that can appear to be their by-products: "Scientists are not interested in the butterflies in our stomach, but in love," writes Ad Vingerhoets, a professor at Tilburg University in the Netherlands and the world's foremost expert on crying, in his 2013 book, *Why Only Humans Weep*.

But crying is more than a symptom of sadness, as Vingerhoets and others are showing. It's triggered by a range of feelings—from empathy and surprise to anger and grief—and unlike those butterflies that flap around invisibly when we're in love, tears are a signal that others can see. That insight is central to the newest thinking about the science of crying.

DARWIN WASN'T THE ONLY ONE with strong opinions about why humans cry. By some calculations, people have been speculating about where tears come from and why humans shed them since about 1,500 B.C. For centuries, people thought tears originated in the heart; the Old Testament describes tears as the by-product of when the heart's material weakens and turns into water, says Vingerhoets. Later, in Hippocrates' time, it was thought that the mind was the trigger for tears. A prevailing theory in the 1600s held that emotions—especially love—heated the heart, which generated water vapor in order to cool itself down. The heart vapor would then rise to the head, condense near the eyes and escape as tears.

Finally, in 1662, a Danish scientist named Niels Stensen discovered that the lacrimal gland was the proper origin point of tears. That's when scientists began to unpack what possible evolutionary benefit could be conferred by fluid that springs from the eye. Stensen's theory: Tears were simply a way to keep the eye moist.

Few scientists have devoted their studies to figuring out why humans weep, but those who do don't agree. In his book, Vingerhoets lists eight competing theories. Some are flat-out ridiculous, like the 1960s view that humans evolved from aquatic apes and tears helped us live in saltwater. Other theories persist despite lack of proof, like the idea popularized by biochemist William Frey in 1985 that crying removes toxic substances from the blood that build up during times of stress.

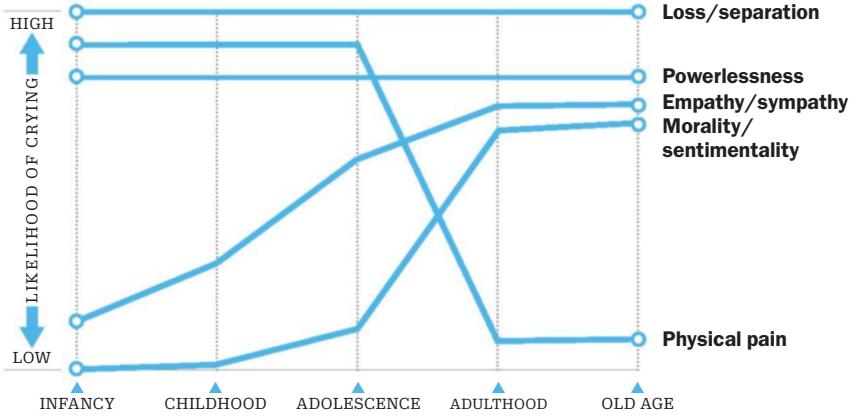
Evidence is mounting in support of some new, more plausible theories. One is that tears trigger social bonding and human connection. We cry from a very early age in order to bring about a connection with others. While most other animals are born fully formed, humans come into the world vulnerable and physically unequipped to deal with anything on their own. Even though we get physically and emotionally more capable as we mature, grownups never quite age out of the occasional bout of helplessness. "Crying signals to yourself and other people that there's some important problem that is at least temporarily beyond your ability to cope," says Jonathan Rottenberg, an emotion researcher and professor of psychology at the University of South Florida. "It very much is an outgrowth of where crying comes from originally."

New research is also showing that tears appear to elicit a response in other people that mere distress does not. In a study published in February in the journal *Motivation and Emotion,* researchers found that tears activate compassion. When test subjects were shown a photograph of someone crying, compared with the same photo with the tears digitally removed, they were much more likely to want to reach out and reported feeling more connected to that person.

Sob stories

Key findings from more than 5,000 criers in 37 countries

Why we cry changes as we get older



How often do people cry?

Women cry **2 to 5 times a month;** men cry **1 time every two months**

52% of people report feeling better after crying, **38%** report feeling the same, and **10%** report feeling worse

Most common tear triggers:

WOMEN SAY	MEN SAY
1. Tragic events	1. Funerals
2. Funerals	2. Breakups
3. Breakups	3. Tragic events
4. Sad movies and TV shows	4. Laughing
5. Despair	5. Sad movies and TV shows

The top 5 places people cry:

9% Public places
7% In transit
6% Work or school
1% Health care settings

SOURCES: AD VINGERHOETS; THE INTERNATIONAL STUDY ON ADULT CRYING

When do people cry?

The most popular time for tears is **7 p.m.–10 p.m.**

35% of people tend to cry alone, **30%** cry with one person present, and **35%** cry with at least two other people

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Scientists have also found some evidence that emotional tears are chemically different from the ones people shed while chopping onions—which may help explain why crying sends such a strong emotional signal to others. In addition to the enzymes, lipids, metabolites and electrolytes that make up any tears, emotional tears contain more protein. One hypothesis is that this higher protein content makes emotional tears more viscous, so they stick to the skin more strongly and run down the face more slowly, making them more likely to be seen by others.

Tears also show others that we're vulnerable, and vulnerability is critical to human connection. "The same neuronal areas of the brain are activated by seeing someone emotionally aroused as *being* emotionally aroused oneself," says Trimble, a professor emeritus at University College London. "There must have been some point in time, evolutionarily, when the tear became something that automatically set off empathy and compassion in another. Actually being able to cry emotionally, and being able to respond to that, is a very important part of being human."

A less heartwarming theory focuses on crying's ability to manipulate others. Researchers believe that just as babies use tears as a tool for getting what they need, so do adults—whether they're aware of it or not. "We learn early on that crying has this really powerful effect on other people," Rottenberg says. "It can neutralize anger very powerfully," which is part of the reason he thinks tears are so integral to fights between lovers—particularly when someone feels guilty and wants the other person's forgiveness. "Adults like to think they're beyond that, but I think a lot of the same functions carry forth," he says.

A small study in the journal *Science* that was widely cited—and widely hyped by the media—suggested that tears from women contained a substance that inhibited the sexual arousal of men. When 24 men sniffed real tears, they felt less aroused by photos of women's faces, and when 50 men sniffed them, they had sharply reduced testosterone levels in their saliva than they did when they sniffed the control saline. "I won't pretend to be surprised that it generated all the wrong headlines," says Noam Sobel, one of the study's authors and a professor of neurobiology at the Weizmann Institute of Science in Israel. Tears might be lowering sexual arousal—but the bigger story, he thinks, is that they might be reducing aggression, which the study didn't look at. Men's tears may well have the same effect. He and his group are currently wading through the 160-plus molecules in tears to see if there's one responsible.

WHAT ALL OF THIS MEANS for people who don't cry is a question researchers are now turning to, because why, exactly, some people don't cry is still not fully understood. If tears are so important for human bonding, are people who never cry perhaps less socially connected? That's exactly what preliminary research is finding, according to clinical psychologist Cord Benecke, a professor at the University of Kassel in Germany. He conducted intimate, therapy-style interviews with 120 individuals and looked to see if people who didn't cry were different from those who did. He found that they were.

"In general, they were not that closely bonded to others," Benecke says. "The noncrying people had a tendency to withdraw and described their relationship experiences as less connected." Tearless people also experienced more negative aggressive feelings, like rage, anger and disgust, than people who cried.

There are other reasons people don't cry, of course. Some report that their tears dried up while they were taking certain medications, like antidepressants. Certain immune disorders and psychological problems like posttraumatic stress disorder have also been linked to not crying. More research is needed to determine whether people who don't cry really are different from the rest of us, and some is soon to come: those emailers who heard Trimble on the radio that morning in 2013 are now the subjects of the first scientific study of people with such a tendency.

If tears are so important for human bonding, are people who never cry perhaps less socially connected?

So far, though crying appears to have interpersonal benefits, it's not necessarily unhealthy not to do it. Virtually no evidence exists that crying comes with any positive effects on health. Yet the myth persists that it's an emotional and physical detox, "like it's some kind of workout for your body," Rottenberg says. One analysis looked at articles about crying in the media—140 years' worth—and found that 94% described it as good for the mind and body and said holding back tears would result in the opposite. "It's kind of a fable," says Rottenberg. "There's not really any research to support that."

Also overblown is the idea that crying is always followed by relief. "There's an expectation that we feel better after we cry," says Randy Cornelius, a professor of psychology at Vassar College. "But the work that's been done on this indicates that, if anything, we don't feel good after we cry." When researchers show people a sad movie in a laboratory and then measure their mood immediately afterward, those who cry are in worse moods than those who don't.

But other evidence does back the notion of the so-called good cry that leads to catharsis. One of the most important factors, it seems, is giving the positive effects of crying—the release—enough time to sink in. When Vingerhoets and his colleagues showed people a tearjerker and measured their mood 90 minutes later instead of right after the movie, people who had cried were in a better mood than they had been before the film. Once the benefits of crying set in, he explains, it can be an effective way to recover from a strong bout of emotion. (Not surprisingly, how cathartic a cry is depends on whether people react well—and whether the situation causing those tears is ameliorated.)

Modern crying research is still in its infancy, but the mysteries of tears—and the recent evidence that they're far more important than scientists once believed—drive Vingerhoets and the small cadre of tear researchers to keep at it. "Tears are of extreme relevance for human nature," says Vingerhoets. "We cry because we need other people. So Darwin," he says with a laugh, "was totally wrong." ◻

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Time Off

'EVEN THE ARTIST'S SON SAID HE NEVER AUTHENTICATES HIS FATHER'S CREATIONS.' —PAGE 80

Mark, left, and Jay Duplass's big break came in 2003 with their seven-minute, $3 film This Is John

PROFILE

How a pair of fraternal filmmakers perfected low-budget success

By Eliana Dockterman

MARK DUPLASS PELTS HIS BROTHER Jay with popcorn as Jay bowls a strike from between his legs at Brooklyn Bowl, a popular haunt in Williamsburg. The neighborhood is one of the few places the indie filmmakers might actually be recognized, but fellow keglers take no notice. "We're in the best spot right now. We can walk the streets of any city, and nobody knows who the hell we are. But Quentin Tarantino—*Tarantino!*—comes up to us at a party and for 30 minutes is telling us why he thinks our movies are great," says Mark, the younger half of the duo that has directed, written or produced 24 films and television shows over the past 13 years, including HBO's *Togetherness,* which started its second season on Feb. 21. Actors love them too: Kristen Wiig, Jonah Hill and Jason Segel have all worked with the pair, usually at a deep discount.

In Hollywood, the Duplass brothers are known as the guys who rewrote the rules on how to make small films in a town that craves blockbusters. And after years of rejecting huge paychecks in favor of working on quieter, quirkier fare, they recently cut major deals to develop several projects with HBO and four movies with Netflix—not to mention a book deal with Random House.

If you recognize either of the Duplasses, it's most likely from their acting roles. With the charisma of a former high school athlete, Mark, 39, has been the face of their movies, such as *Safety Not Guaranteed* and *The One I Love,* and starred on FX's *The League.* After years behind the camera, Jay, who turns 43 on March 7, was recruited by Jill

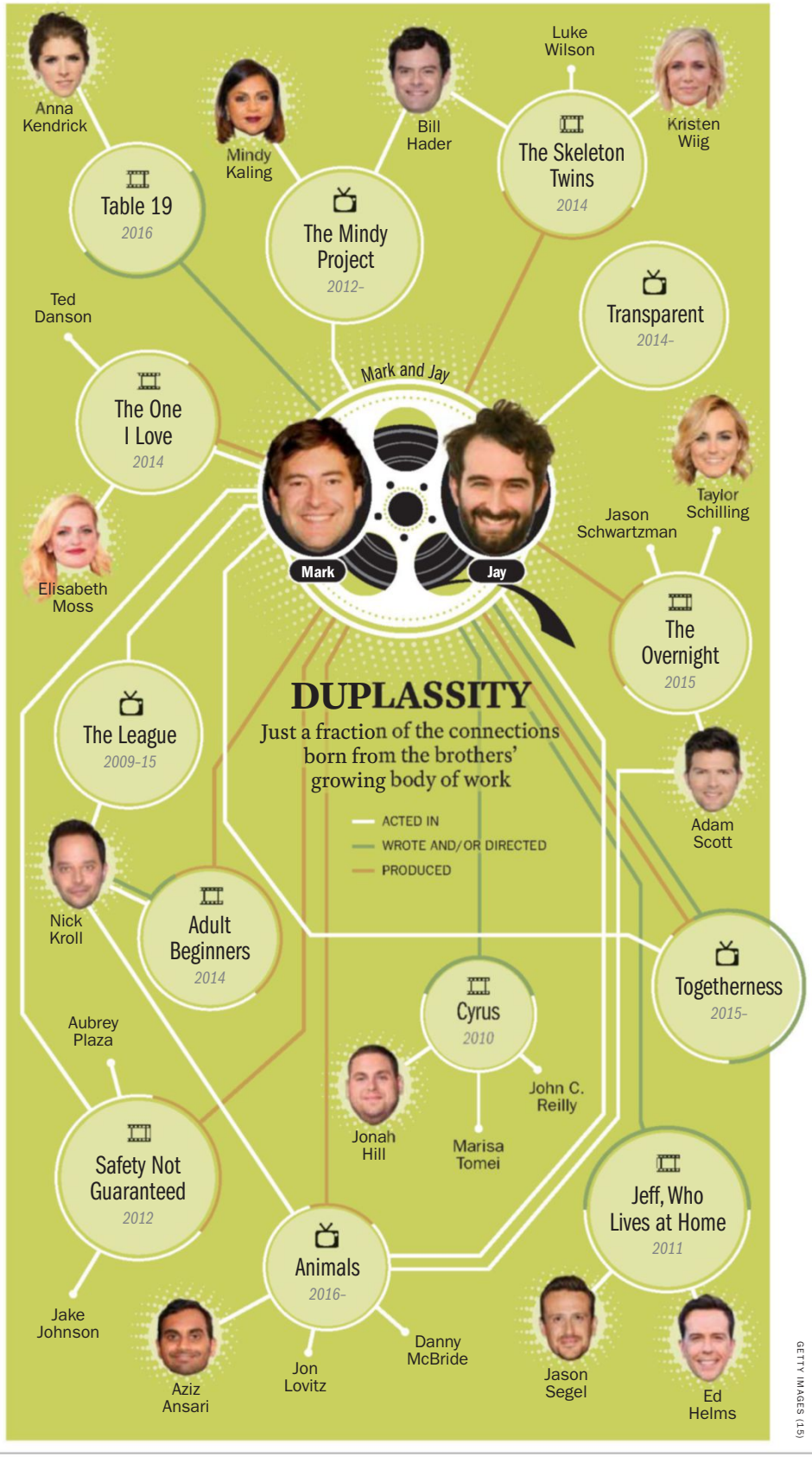
PHOTOGRAPH BY KENNETH BACHOR FOR TIME

Soloway for her Emmy-winning Amazon series *Transparent*. Off camera they're rarely apart.

"Jay and I were an inseparable unit—basically married—from a very early age," Mark says. "And then we got actually married and it was like, 'Now we're in *two* marriages, how does that work?' It's the stuff that birthed *Togetherness*." In the dramedy, married man Brett (Mark) struggles to prioritize his wife Michelle over his best friend. The Duplasses pride themselves on being deeply honest, to the point of discomfort. One episode features a grimace-worthy attempt by Brett and Michelle to spice up their sex life, ending in Brett nursing his gonads with an ice pack. "We're the guys you avoid at a party if you don't want to go deep," Jay says. "We hate small talk."

THEY BEGAN MAKING MOVIES while growing up in the Metairie suburb of New Orleans, with Jay holding the camera because he was older and stronger. "It was like, 'We have two hours until dinner. We've got Mark, a keyboard and a magic set where half the crap is missing. What can we make?'" Jay recalls. The scrappy approach earned them their first break. Obsessed with *Raising Arizona* and *Fargo,* the Duplasses initially dreamed of becoming the next Coen brothers. In 2001 they invested everything they had to make a film about an aspiring Olympic runner. They now deem this unfinished work "dog sh-t." "We failed terribly," Mark says. The Coens "see every frame the minute they start writing a movie. We're not capable of that. We're discovery guys. We like to improvise." Desperate and out of cash, they filmed a seven-minute short, *This Is John,* about a man who suffers a breakdown while trying to leave his outgoing answering machine message. Made for $3 (the cost of the MiniDV tape), it was accepted at the 2003 Sundance Film Festival.

The plot of their first feature film, *The Puffy Chair,* was reverse engineered from materials at hand: Mark's van, two cheap overstuffed chairs and a Home Depot policy that allowed them to buy equipment and return it within 30 days for a full refund. *The Puffy Chair* became the first purchase of Netflix's then nascent production company. It



GETTY IMAGES (15)

also caught the attention of Hill, who offered to star in their next movie, *Cyrus*. The brothers kept their budgets small by using cheap digital technology and courting artistically starved actors with the kinds of roles nobody else would offer them. Their work struggled in theaters but flourished on streaming services. Even now, their films rarely cost more than $1 million, but they maintain creative control of what they make.

That's a rarity in Hollywood, where success usually means being tapped for a blockbuster franchise. But the Duplasses have refused such offers. "It would hurt our soul and hurt our reputations," says Mark. "I think it's possible to make a movie at that level with some integrity. But it's so blatantly obvious to us that those movies are a commodity first." That's an untenable position for most filmmakers, which is why the brothers fund a host of emerging talent. For their second HBO project, *Animals,* an adult cartoon that premiered Feb. 5, they hooked up creative team Mike Luciano and Phil Matarese with comedians such as Aziz Ansari and Jon Lovitz to provide voice acting.

Many of the projects the Duplasses produce have the same sensibility as *Togetherness*—white, upper-middle-class people dealing with privileged problems. Acutely aware of their limited worldview, they've sought to produce films with different perspectives, like last year's Sundance favorite *Tangerine,* about two trans women of color. (In typical Duplass form, it was shot entirely on an iPhone 5S.) Producing will increasingly be their focus as diverging interests drive them apart. But they'll continue co-writing and directing *Togetherness,* along with writing films like the upcoming *Table 19,* starring Anna Kendrick. Because their success is premised on an us-against-the-world mentality, "there's the feeling of, f-ck this band. I want to make my solo record," Mark says. "But that tends to get rubbed out because we're a little anxious in the world and need each other." ◻

TELEVISION

Growing up is hard to do on *Togetherness*

TV loves characters with broad, sweeping visions—people who want to dominate their industries or triumph over their adversaries. By contrast, the characters on *Togetherness* are flat-out lazy. In the show's second season, which premiered Feb. 21, our central characters are simply trying to do as little emotional damage as possible. That's precisely the reason the show is so revelatory.

In Season 2, married couple Michelle and Brett (Melanie Lynskey and show co-creator Mark Duplass) are in a holding pattern, unready to break up or fix their relationship. Brett is spending his time on an amateur musical adaptation of the sci-fi novel *Dune* with actor pal Alex (Steve Zissis), while Michelle halfheartedly noodles over a plan to start a charter school, something she's not even sure she wants anymore.

Their goals are perfectly specific to the L.A. cool-parent milieu. But there's something here for any viewer who's been taken by surprise at getting older. One of the season's most moving subplots features Michelle's sister Tina (Amanda Peet); after drifting from passion to passion, she realizes she'd make a great mother, a bit of personal growth that may have come too late for anything but regret.

All the characters expected they'd have more youth; forced to get serious, they rebel, before very slowly starting to grow up. "The things that I thought were going to happen are just not going to happen," Tina says in an emotional moment. Figuring out how to cope, and what to do next, has rarely been drawn so well—or, though Michelle and Brett would hate the word, so ambitiously.

—Daniel D'Addario

Togetherness *airs Sundays at 10:30 p.m. E.T. on HBO*

QUICK TALK

Michael Kelly

The Emmy nominee returns as loyal, murderous presidential consigliere Doug Stamper in House of Cards' *fourth season, premiering on Netflix on March 4.*

What does Doug get out of his relationship with Frank Underwood? He's an addict. Frank and that job are an addiction, just like Rachel, like alcohol.

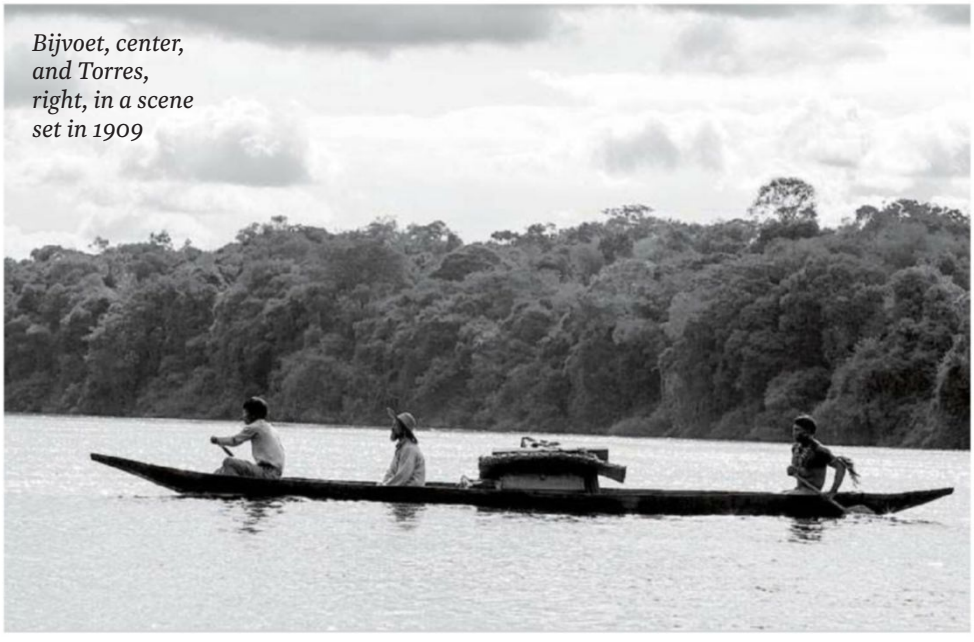
In the original script for last season's finale, Doug didn't kill Rachel. But you and showrunner Beau Willimon decided to change her fate. Why? We knew Doug was 99% sure he would never see Rachel again, but there was that 1% of doubt. He couldn't go to Frank and say they were all good when they weren't. He had to kill her.

Your kids guest-starred as Doug's niece and nephew last season. It was hell. I was so stressed. My son was 2 and cried the whole time. But my daughter loved it. She's so funny, a typical actor. When she saw it, she goes, "That's it?" Their scene was only one minute long.

Any parallels between the show and real-life politics? D.C. staffers always come up to me and go, "I know a guy just like Doug." So, unfortunately, yes.

Could Frank beat Donald Trump in an election? Definitely. It's going to be difficult for Trump to keep answering questions, "I'll make a deal." He'll get called out on that. At least I hope so, because the thought of that man being President is scary.

Scarier than a killer President? Frank knows how to run a country, even if he did push someone in front of a train. —E.D.



Bijvoet, center, and Torres, right, in a scene set in 1909

MOVIES

Embrace of the Serpent honors the mystical without denying the natural

THE MYSTICAL ALLURE OF CIRO GUERRA'S AMAZONIAN drama *Embrace of the Serpent* is so potent that it might take you a while to realize you're watching an anticolonialist parable. Maybe that's the key to a good allegory: the ideas seep into your skin rather than conk you on the head. The third feature from Colombian filmmaker Guerra—and an Oscar nominee for Best Foreign Language Film—*Embrace of the Serpent* tells the story of Amazon shaman Karamakate, a loner who reluctantly serves as a guide for two explorers, decades apart. The first, gaunt, bearded Theo (Jan Bijvoet), passes through in 1909: he's gravely ill, and the then young Karamakate (Nilbio Torres) eyes him suspiciously before agreeing to help. The second, Evan (Brionne Davis), paddles in on his canoe around 1940. By that time, Karamakate (now played by Antonio Bolivar) is a robust elder with searching, skeptical eyes, even more wary of outsiders than before.

Both white men have come in search of an exceedingly rare plant, one with great healing properties as well as psychotropic ones. Karamakate, ever mindful of the way intruders from "civilized" Colombia raped his people's land for rubber, forges an uneasy truce with each of them, as if acceding to the idea that human connections are ultimately more important than any stubborn pursuit of mystical purity. But the majesty of nature is *Embrace of the Serpent*'s true star, and Guerra captures the glory of every leaf, every inch of sky, in pearlescent black and white as luminous as the lining of a clamshell. In Guerra's eyes, as in Karamakate's, the forest is magic itself, no less remarkable for having sprung from something as lowly as the earth's soil. —STEPHANIE ZACHAREK

THE REAL SCIENTISTS BEHIND *SERPENT*

Serpent's fictional explorers are inspired by ethnologist Theodor Koch-Grünberg and botanist Richard Evans Schultes, above

MOVIES

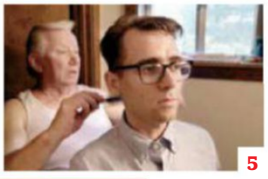
Race fails to do Jesse Owens justice

TRACK-AND-FIELD STAR Jesse Owens, one of the great athletes of the 20th century, won four gold medals at the 1936 Olympics in Berlin—a victory made even sweeter by the fact that Owens was an African American competing in a country already enacting its mission of ethnic cleansing. But Stephen Hopkins' *Race*, starring Stephan James (who played John Lewis in *Selma*), doesn't come close to being the biopic Owens deserves. For one thing, it presents Hitler's favorite filmmaker, the opportunistic Leni Riefenstahl (Carice van Houten), so sympathetically that she's almost heroic. Worse yet, *Race* makes racism—not Owens—the star of the show: he comes off as a man who let events shape him, instead of the other way around. Even so, James gives his portrayal of Owens some quiet gravity, and his scenes with Jason Sudeikis (as Owens' devoted coach Larry Snyder) radiate warmth. Otherwise, *Race* is a puzzling failure: a movie about a great athlete that has no muscle tone at all. —S.Z.

1. *Flophouse*
2. *Weediquette*
3. *F-ck, That's Delicious*
4. *Gaycation*
5. *Balls Deep*

VICELAND'S SHOWS TO WATCH FOR

Original series will air Tuesdays through Thursdays at 10 p.m. E.T.



TELEVISION

A Vice TV network shows the limits of rebelliousness

By Daniel D'Addario

VICE, THE MEDIA CONGLOMERATE that styles itself as the place for the cool, the young and the new, has taken a seriously unhip turn. What began as a magazine in 1994—and now has a mammoth web presence and a surprisingly earnest HBO newscast—is taking over the cable-TV slot formerly held by History offshoot H2. On Feb. 29, Viceland debuts.

It's a major development for Vice and one in which it is investing major resources: the Oscar-winning filmmaker Spike Jonze is the network co-president, and CEO Shane Smith has predicted that the Viceland team will appear on the cover of this magazine as "the guys who brought millennials back to TV." But the fate of H2 and other recent washout channels like al-Jazeera America, G4 and Universal Sports Network makes the challenge painfully clear. To thrive in an overcrowded cable landscape, a network needs either a breakout hit (like AMC's *Mad Men*) or a compelling reason to exist (like FX's devotion to shock and, sometimes, awe). The new channel has attitudes borrowed from other Vice properties: irreverence, curiosity, fondness for controlled substances. But its Vice-iness tends to work against the potential hits.

The six shows Viceland will air in its first weeks may be unified in point of view, but their quality varies wildly. The rapper Action Bronson's food series, *F-ck, That's Delicious,* smacks of Vice's worst conceit, the self-congratulatory presumption that being excited to go somewhere offers, in and of itself, meaningful insight about that place. The food is shot unappealingly, and the descriptions are worse: an *uni* bowl is "like a KFC mix bowl," per Bronson and his entourage, while Jamaican food is "for your bowel movements." Says Bronson: "It's like I'm living out my dreams." Good for him! Bad for us.

The calories provided by Viceland's other offerings aren't quite as empty, leaving aside *Flophouse,* a young-comic showcase with an aggressively amateurish vibe. *Balls Deep,* which explores the evangelical tent-revival scene in the South, feels a bit too impressed with itself for making discoveries about religious people that aren't discoveries at all, but it's an amiable watch. The music-documentary series *Noisey* has a genuinely engaging look at the Compton that Kendrick Lamar raps about and could end up filling the music-reporting space that MTV long ago left behind.

Very little on Viceland feels substantial enough for television. *Flophouse* and *F-ck, That's Delicious* would work better as video clips; instead, they fill out their running time with cool-kid posturing. *Gaycation,* in which the actor Ellen Page travels to different countries to investigate LGBT rights, feels stretched to its limit too. While Page's visits to Japan's gay bars offer interesting cultural tidbits, there are too many stagily solemn bits of narration telling us how what we've just seen is outrageous.

Viceland is trying to appeal to millennials by being unlike TV in the ways millennials are unlike their parents: unmotivated one moment, moony over social justice the next. It's no surprise that its standout show is *Weediquette,* on which host Krishna Andavolu puts Vice's probing curiosity to work on a single issue: legalized marijuana.

Weediquette marries a welcome touch of visual wit (and Andavolu's familiarity with pot) with genuine insight about social change. It's proof, at least for one millennial viewer, that Viceland's focus on using an old delivery system to tell stories in new ways has things backward. *Weediquette* would be good no matter what platform it ran on precisely because it represents the best of what TV can do. Hopefully, the rest of the channel will catch up. ◻

EMBRACE OF THE SERPENT: OSCILLOSCOPE; SCHULTES: ECONOMIC BOTANY ARCHIVES—HARVARD UNIVERSITY; RACE: FOCUS FEATURES; VICELAND (5)

A fake Rothko and the rise of modern fraud

By Belinda Luscombe

AS FINE-ART TRIALS GO, THEY DON'T get much juicier. Domenico De Sole, chairman of Sotheby's auction house, was suing Knoedler & Co., once one of New York City's most prestigious art dealers, for selling him a dud. In 2004, De Sole and his wife paid $8.3 million for *Untitled, 1956,* a work by the mid-century Abstract Expressionist Mark Rothko, which they loved right up until they discovered, seven years later, that it was really a painting of squares done by a Chinese guy in Queens.

The painting was one of dozens of fraudulent modern masterpieces the now defunct gallery sold, to the tune of $70 million, in one of the most shocking art swindles in history. The real painter, Pei-Shen Qian, has fled to China. The Long Island dealer who brought the fakes to Knoedler, Glafira Rosales, has pleaded guilty to wire fraud, money laundering and tax evasion. And on Feb. 16, Spanish authorities cleared the way for one of her associates to be extradited to the U.S. to face similar charges.

The De Soles' civil suits were settled out of court but not before two weeks of expert testimony in late January and early February demonstrated how skittish art experts have become about guaranteeing a painting's authenticity. One Abstract Expressionist scholar admitted that he had previously said all Rothkos look alike. Another, the author of a Rothko catalog, said he was personally familiar with only three or four of the painter's works. Even the artist's son said he never authenticates his father's creations.

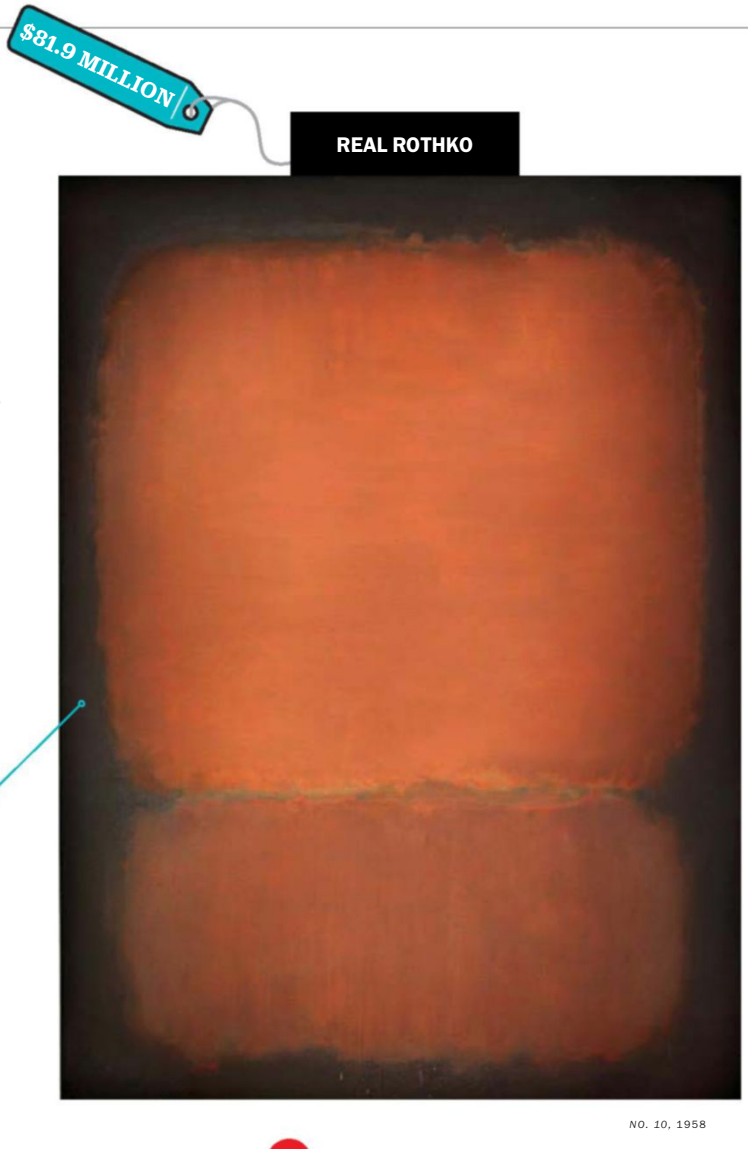
That a gallery of the 165-year-old Knoedler's reputation could be either fooled or ripping off its clients has sent shudders through the art world, and not just because it feeds into the perception among nonhabitués that a) anybody with a can of paint and a drop canvas could create an abstract masterpiece and b) a painting's worth is a matter of smoke, mirrors and marketing.

Until the past few weeks, modern-art sales had been on a tear, with every auction exceeding expectations. In February, it was announced that David Geffen had let go of a 1955 Willem de Kooning abstract and a 1948 Jackson Pollock splatter painting for $500 million in a private sale. Christie's sold a Picasso last year for $179 million—about five times what was paid for the same work in 1997. For the rich, a great work by the right artist has come to be seen as a surefire investment, and far more fun to look at than Berkshire Hathaway stocks.

Rothko is one of those artists. His *No. 10* (above) sold for $82 million on the same night as the Picasso. And *No. 6 (Violet, Green and Red)* is the third most expensive painting ever sold publicly—now owned by a Russian fertilizer tycoon who paid $86 million and then asked police in Monaco to arrest his art broker for fraud and money laundering.

But the staggering sums involved have made it trickier to ensure that a painting is the real deal. Experts often decline to render a judgment for fear of being sued by enraged owners. The Pollock-Krasner Foundation, which used to authenticate Pollock's works, now declines all requests. Likewise, the Andy Warhol Foundation for the Visual Arts spent $7 million defending one lawsuit, then closed its authentication board.

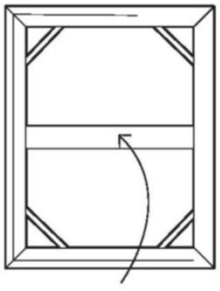
A painting's worth is established in three ways: connoisseurship (what the experts say), provenance (the paper trail


$81.9 MILLION
REAL ROTHKO
1
PROVENANCE
The fake lacks documentation tracing its origins to Rothko. The story behind the work, that it was part of a private collection of a shadowy Swiss collector that was hermetically sealed, was fabricated.
2
ANIMAL GLUE
Rothko applied a base of powder pigments in animal glue. This translucent coat prevents the canvas from absorbing too much paint. The fake has no glue.
NO. 10, 1958
3
WHITE PRIMER
Instead of a translucent base layer, the untitled fake, dated 1956, has two opaque white layers, one of which is a water-based acrylic that Rothko didn't use until the 1960s.

REAL ROTHKO: NO. 10, 1958—MARK ROTHKO ©KATE ROTHKO PRIZEL AND CHRISTOPHER ROTHKO/ARTISTS RIGHTS SOCIETY (ARS),

UNTITLED, FALSELY DATED 1956

BACK OF PAINTING



CROSSBAR

5

CROSSBAR MARKS

Large canvases have a back crossbar for stability. Rothko made a space between the canvas and the crossbar to avoid crossbar marks while painting. The fake has the marks, which also show that it was painted twice.

4

RED PAINT

Some paint on the fake Rothko contained Pigment Red 170, which also is anachronistic with the 1956 date. That paint wasn't developed until the 1960s.

that traces the work back to the artist) and forensics (analysis of the materials). What makes modern works easier to forge is not that anybody can paint like an Expressionist: it's that it's much easier to create a plausible paper trail and to find the pigments, brushes and materials that are true to the era. As forensic analysis gets more sophisticated—using Raman microspectroscopy, X-ray diffraction, thermoluminescence or fingerprint analysis—so do the forgers' techniques. Some even create pop-up labs to offer a favorable opinion.

With connoisseurs cowed, the odds of spotting a fraud grow ever smaller. One Swiss art-authentication lab opined that 50% of the art market—most of which is unregulated—is likely forged.

While that number may be high, rooting out the counterfeits is tough. "It is exceedingly rare for forgery cases to go to trial," says Leila Amineddoleh, a lawyer who specializes in art fraud. "Owners are humiliated, and even if the work is genuine, the question mark affects its value."

What are poor, insanely rich art collectors to do? Often they just quietly sell dubious pieces, thus perpetuating the cycle. One of Amineddoleh's clients has come up with a different solution: buy only directly from artists. The work may never be as valuable, but at least owners know that their wall decoration is exactly what they think it is. □

HISTORY

Not fine art

In forgery investigations, the tiniest mistakes can make all the difference, as in the cases below.

PAUL GAUGUIN

Christie's and Sotheby's each offered an identical painting, *Vase de Fleurs,* at the same time in 2000. The dealer who owned the original had a copy made, which he sold with the original letter of authenticity.

THOMAS GAINSBOROUGH

A 1791 landscape oil painting was reportedly undone when faint pencil marks were found below the signature for the forger to trace.

HEINRICH CAMPENDONK

One of the most successful forgers in history, Wolfgang Beltracchi unknowingly used a paint containing traces of titanium white in a phony Campendonk work. There was no titanium white in Campendonk's day.

CLEMENTINE HUNTER

A series of works purportedly by the African-American folk artist had cat hair stuck in the paint, whereas Hunter's originals did not. Her forgers had dozens of cats.

VINCENT VAN GOGH

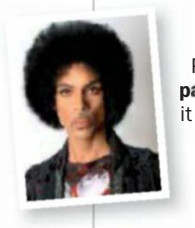
This van Gogh fake was unmasked because it has young van Gogh motifs (a Japanese print of a woman) mixed with mature van Gogh motifs (a bandaged ear).

WITH REPORTING BY EMILY BARONE

Adele **found a silver lining** after sound issues plagued her Grammys performance:

'I'm treating myself to … In-N-Out. So maybe it was worth it.'

Pop-rock group OK Go filmed its latest music video **in a zero-gravity chamber.**



Prince **tweeted his passport photo**—and it was just as Prince-y as you'd expect.

Emily Blunt is **in talks to play Mary Poppins** in Disney's forthcoming sequel to the 1964 classic.

American Girl's newest doll, Melody, has a **backstory that aims to highlight** the 1960s civil rights movement.

Facebook expanded its Like feature to **encompass a range of reactions,** including love, sad and angry.

LOVE IT / LEAVE IT

TIME'S WEEKLY TAKE ON WHAT POPPED IN CULTURE

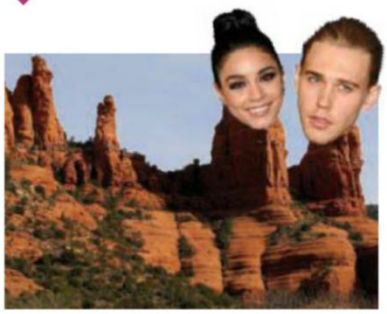
The U.S. Food and Drug Administration warned that products labeled "100% Parmesan" might actually contain **cheese substitutes like wood pulp.**

As part of a public art project, Shia LaBeouf live-streamed himself **spending 24 hours in a small elevator.**

A 33-year-old British man legally **changed his name to Bacon Double Cheeseburger.** "It was the culmination of … too many drinks in the pub," he said.

Rihanna had to **postpone the start** of her *Anti* world tour, citing "production delays."

Actor Vanessa Hudgens posted—then deleted—a photo of her and her boyfriend's names scratched onto one of Arizona's Red Rocks; she's now under investigation for **defacing a protected site.**



San Antonio brunch joint Nectar Wine Bar and Ale House is **selling a $28 mimosa;** it's garnished with caviar, lobster, cheese and muffins.

EMOJIS, OK GO, MIMOSA: FACEBOOK; IN-N-OUT, ADELE, BLUNT, RIHANNA, LABEOUF, PARMESAN, HUDGENS AND BOYFRIEND, RED ROCKS: GETTY IMAGES; DOLL: AMERICAN GIRL; PRINCE: TWITTER; POPPINS: PHOTOFEST; BURGER: WENDY'S; ELEVATOR: ALAMY;

By Nolan Feeney, Samantha Grossman and Ashley Ross

THE AMATEUR

Facebook? Check. Twitter? Check. Instagram? Check. Snapchat? I give up

By Kristin van Ogtrop

ONE RECENT DAY I WENT TO A CONFERENCE AND HEARD Evan Spiegel, the 25-year-old CEO of Snapchat, proclaim, "We've made it very hard for parents to embarrass their children on Snapchat." Suddenly I understood why my two older children (ages 20 and 17) spend 83% of their waking hours on that app with the little ghost icon that lets you send out a video of yourself doing something weird or marginally funny because it will disappear seconds after it's viewed. I am a mom and a social-media stalker, and the mere fact of my existence makes my children feel embarrassed. Until Snapchat, that is. Now the tables are turned.

While I am well aware that technology makes my life much easier, I also just want to go live at Downton Abbey, in Season 1, before Lord Grantham installs the telephone. (Because you know how it goes: as soon as Lord Grantham installs the phone, then widows have trysts with potential husbands in hotels and women start running London magazines and next thing you know: Snapchat.) Alas, there is no returning to the days when I would be expected to wear a tiara to dinner, and so I must adapt. Meet my children where they live, as it were.

Here is my contract with my kids: I pay for your phone, I get to follow you on social media. I agree never to comment, like, share or otherwise announce my presence in their digital lives. I am there but not there. And I will keep my opinions to myself. Until I can't.

A FEW MONTHS BACK I was conducting "virtual oversight" of a friend of my son's, a classmate he was suddenly spending a lot of time with but whom I had never met. I saw on the friend's Twitter profile page a photo of my child doing something spectacularly stupid. I texted my son and said, "You should tell [whatshisname] to remove that photo of you. Your guidance counselor can see that picture, and so can your teachers and college admissions people." Oh, nervy mother! The gall of me, his parent, trying to protect him from his own impulsive, shortsighted, prefrontally challenged teenage self! We went through the sadly familiar motions of an extended text fight (shouldn't there be a name for that? fexting?) about boundaries, how I don't respect them, he has no privacy, I ruin everything, I am so embarrassing, blah blah blah. But within hours the friend took the photo down. And, naturally, made all of his tweets private.

In the name of protective motherhood, I chase my children around social media like Alice in Wonderland down the rabbit hole. But every time I land someplace where the story starts to make sense, my kids change the narrative. As soon as I understood Facebook, they fled to Twitter. Once I got Twitter, they escaped to Instagram. To Luddites like me, each platform is a little less intuitive than the last. And then there's

the Cheshire Cat that is Snapchat. Talk about there but not there. After I listened to Evan Spiegel (looks like he's 12, flies helicopters for fun, curiouser and curiouser!), I asked my 17-year-old if he would teach me how to use Snapchat. Emphatic shake of the head. I asked him for his user name. "Mom!" he huffed. "Can't I have *one* place on social media where you don't follow me?"

ONCE UPON A TIME, teenagers had diaries with tiny locks to keep their secrets from prying moms. Apparently this is healthy behavior when it comes to developing a sense of self and establishing an identity that is separate from that of the two people responsible for your DNA. But now diaries are extinct. And instead of a diary key, all Mom needs—all anybody needs—is a user name.

Because the child sitting right next to me (physically, if not virtually) refused to give me a Snapchat lesson, I turned to my college-student son, who happens to be studying in another country, for help. Thus ensued a humbling encounter we might call "Middle-Aged Woman Lying in Bed Sees How Old She Looks in Selfies, Plus Lots of Photos of Paella." But even after his patient instruction, I still couldn't really figure it out, not to mention grasp the appeal. Two days later I got a message from Snapchat about … how to use Snapchat. Did my sons send help my way? Was my account flagged because I put in my age when I registered (setting off a Clueless Older Person alert)?

Note to Evan Spiegel and my children: even getting that app-generated little tutorial did not help me understand. So I suppose you have won. Because my ineptitude did make me a little … embarrassed. Which, perhaps, is the point.

Van Ogtrop is the editor of Real Simple

ILLUSTRATION BY LUCI GUTIERRÉZ FOR TIME

To read more of this interview, visit **time.com/shimonperes**

Shimon Peres The 92-year-old former Israeli Prime Minister and President recently sat down to talk about why peace is the only option in the Middle East

What do you feel most proud of in 70 years of public life? The things that were done belong to the past. I'm mainly occupied with the things that can and should be done tomorrow.

Are you still involved in any peace negotiations with the Palestinians? I am actually involved in my own efforts to address peace. But I would like to make two remarks. One, peace today is different from peace yesterday because the world has changed. It's become more global and more scientific than it ever was. Second, what people don't understand, you don't begin peace negotiations with a happy end. Keep the happy end for the end. You have to begin from an obscure, complicated situation.

Do you think a two-state solution is still possible? It's the only thing which is possible in order to bring an end to terror, violence and hatred. The Middle East is full of blood and disappointments and problems.

What is the future of Israel without a peace agreement? We will see terror, bloodshed, hatred, victims, everything. So the choice is having a solution which is humane, just, right, and that is a two-state solution. We shouldn't run the lives of the Palestinians. And I think it will come sooner than maybe most people think. If not, we will see the spread of terror.

How did you go from hawk to dove? I didn't change. I think the situation has changed.

What do you think is the greatest obstacle to peace? Disagreement is produced by its own suspicion, hatred, mistrust. The greatest problem today is mistrust. Mistrust produces terror, and each side blames the other side. So it's a machine that works for itself, and we have to bring it down. People will say it's impossible, but that's nonsense. We made peace with Egypt, the largest Arab country. We made peace with Jordan, the nearest Arab country. We started to make peace with the Palestinians, but it was cut in the middle because the Palestinians remained divided in two different groups.

What was it like to negotiate with Yasser Arafat, whom you and most Israelis had until then considered a terrorist? Arafat was a very special character. I sat with him hours and hours and hours, my God. He is not a fool—very far from it. He has an excellent memory. He can remember the date of birth of every person almost. The only thing he doesn't like to remember are facts. I think that's an extra load. So with him it was relatively easy to start but absolutely difficult to conclude.

What do you think is driving the latest Palestinian uprising? It's a mistake. You know, the Arabs tried to attack us several times. What did they gain? They lost life, we lost life. And the same with terror. I think it's useless. I cannot recall anything a terrorist achieved but killing people.

Do you think Benjamin Netanyahu has hurt Israel's relationship with the U.S.? I don't want to go into personal attacks, but I shall say simply: The right thing was to have bipartisan support. Anything that endangers it is a mistake. I believe that we enjoyed something so unique and promising, having the two parties support the state of Israel in a very difficult time. We should continue to do whatever we can to keep it.

Many Israelis are critical of President Obama. What do you think? I think he is a great leader, a great President, and Obama too should be judged by the record. I didn't say he didn't make mistakes. I think the history books will judge him as a great President. Everybody in Israel knows when it comes to Israel's security, he answered our calls. And he was really the best we could have asked for. And we have to say thank you. —YARDENA SCHWARTZ

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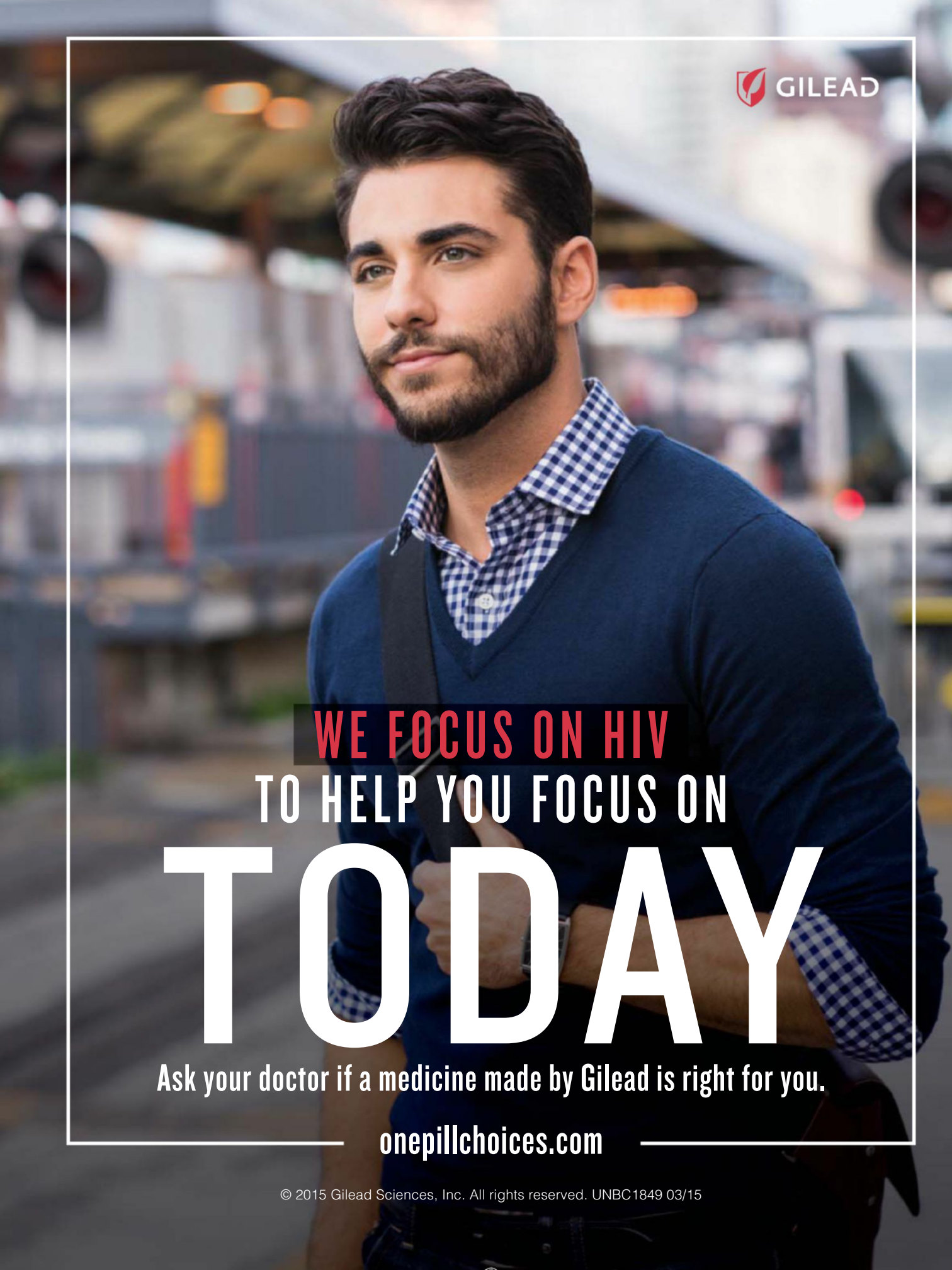
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